CHNOLOGY DEPARTMENT

Flow

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DETROIT

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS

MAY
1948

1948 FLOW Cost Analysis Contest Announcement — see page 39

Assured Dependability

FOR HANDLING HEAVY LOAD

THERE'S good reason why experienced users give the call to Hevi-Lifts for their toughest handling jobs. It's the hoist that leads the field in heavy-duty design — that handles full capacity loads dependably — safely — year after year. And without the petty annoyances and breakdowns that cause delays.

When you handle costly loads, you want the best. You need it. And it costs you less in the long run.

P&H Hevi-Lifts are available with 5-step variable speed push-button control, offering a change of pace for all motions in lifting, traveling and lowering. Call in a P&H materials handling engineer, or write for literature.

These *ADDED VALUES* are Standard Equipment on P&H Hevi-Lifts

SAFER—P&H's true motor ratings insure against failure at full capacity loads and speeds. Thermal overload protection prevents motor burn-outs. Control current reduced to 110 volts at push-button. Crane type limit switch and double brakes provide maximum safety.

LIFETIME CONSTRUCTION — Precision construction — shaved gears — grease-sealed bearings — moisture-proof, dust-proof, acid-proof.

SMOOTHER OPERATION — Motor specifically built for hoist service — high starting torque, frequent reversal, etc. Controls loads within a fraction of an inch.

Handle it "thru-the-air" at lower cost

CAPACITIES UP TO 30,000 LBS.

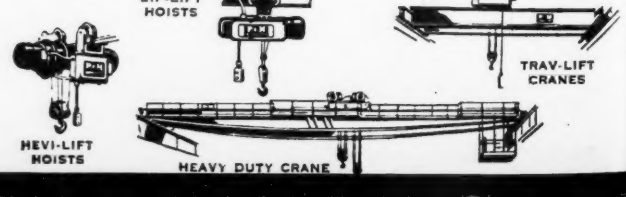
P&H

ELECTRIC HOISTS

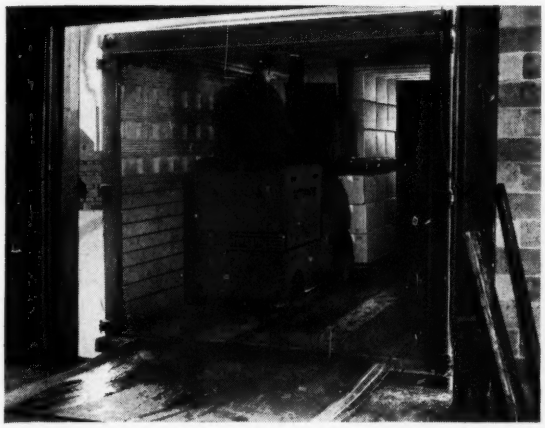
4643 West National Avenue
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

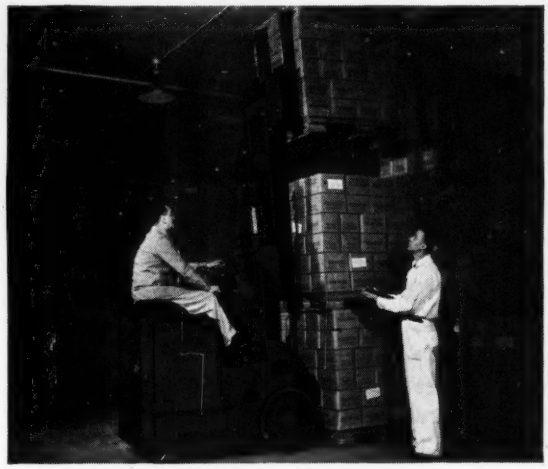
HOISTS · WELDING ELECTRODES · MOTORS · P&H · EXCAVATORS · ELECTRIC CRANES · ARC WELDERS



Only Skylift ELECTRIC TRUCKS GIVE YOU High Pressure Hydraulic Lift



Skylift takes load through low doorways, then tiers the product inside, with low ceilings no handicap. BELOW, you see the same Skylift tiering 130 inches high in high-ceiling warehouses . . . a dual operation made possible by high pressure hydraulic lift.



Automatic is First With Most Great Features

1 Caster type steering axle, center pivoted and shock-proof. Compensates for uneven floor conditions. Provides easier steering, prevents transmission of road shock to steering wheel.

2 Air-cooled disk brake. Mounted on end of motor where brake torque is least. This greatly prolongs life, gives greater braking surface, insures positive and smooth stopping.

3 Full automotive type controls. Brake pedal and foot accelerator same as a car. One lever controls lift and tilt, the other forward and reverse. NEW-matic controller gives smooth, timed automatic acceleration through all speeds.

4 Lift, tilt and drive simultaneously or independently with easy finger-tip and foot control regardless of load conditions. The only hydraulic industrial truck that does not sacrifice lift or tilt performance to accomplish this feature, because only Skylift has High Pressure Hydraulic Lift and Tilt.

Skylift
ELECTRIC TRUCKS
Lifts Like Loads

● Before you buy any industrial truck ask: "Has it *high pressure* or *low pressure* hydraulic lift?" You see, here is why it's so important to you.

Low pressure systems are fast becoming antiquated. *High pressure* hydraulic lift is a *modern, up-to-date system*—it is compact and efficient—and therefore, trucks so equipped can be much smaller in design to obtain better results.

There are other advantages, too. With Automatic's exclusive patented design, using *high pressure* hydraulics, you can *raise forks to maximum height of single lift,* before *increasing overall height of uprights.* Forks raise *67 inches before uprights begin to extend!*

As you see by the pictures at the left, you get easy entry into box cars and other low clearance portals. You tier to maximum height without uprights jabbing into ceilings. The same Skylift also tiers up to 130 inches high, giving you a complete handling system for both LOW and HIGH CLEARANCE moving and tiering.

Only Automatic Skylifts offer you this double-duty money-saving feature, because ONLY Skylift Electric Trucks are equipped with HIGH PRESSURE Hydraulic Lift. No other industrial trucks have it, no others can offer it, because it is a PATENTED Automatic feature. Mail coupon.

Only Automatic GIVES YOU "BURN-OUT PROOF" Silicone Insulated Motors

● Constant starting, stopping, reversing and overloading gives a motor an awful beating—often causes overheating, which means motor failure, trucks out of service.

Automatic foresaw the demands which would be put on Skylift Electric Trucks, so gave you the protection of SILICONE MOTOR INSULATION. This is an exclusive silicone varnish and silicone lubricant that protects Skylift motors, even if overloaded, and even after exposure to temperatures of 300 to 400 degrees Fahrenheit.

This means no armature or field coil failure, no trucks laid up for motor repair, no interruption of Skylift's smooth, efficient money-saving material handling operation. NO OTHER industrial trucks offer this EXCLUSIVE feature! Mail coupon.

AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE AND TOWNE MFG. CO.
141 W. 87th St., Dept. E-8, Chicago 20, Ill.

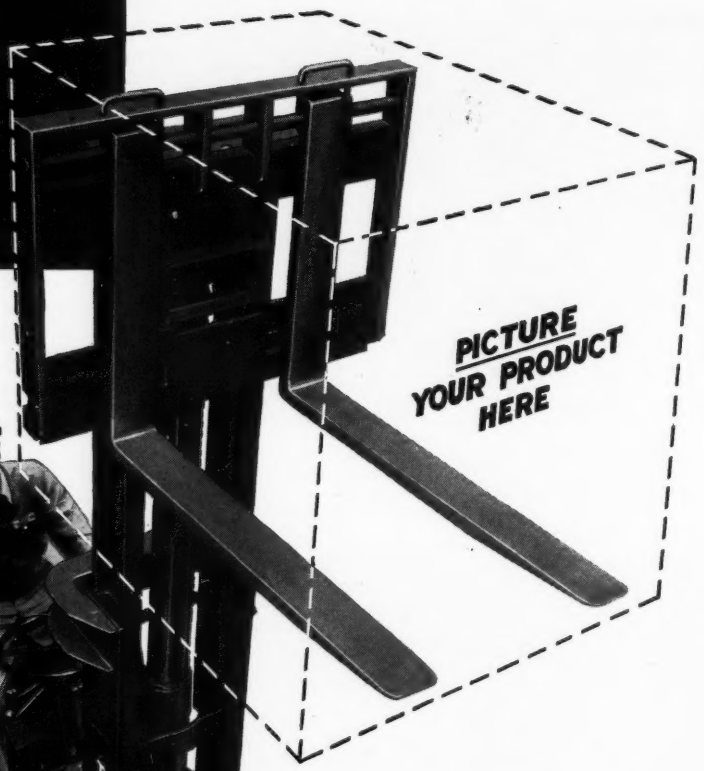
( ) Send details on Automatic's Skylift Electric Trucks and *exclusive* HIGH PRESSURE HYDRAULIC LIFT.

( ) Have an ATCO Specialist make a free survey of our material handling costs.

Company Name.....
By.....
Street Address.....
City.....Zone.....State.....

You Need MH* to Save Space!

UNLOADER



*M H is MASS HANDLING—the systematic movement of the most units, in the shortest time, at the lowest cost.

SIDE SHIFTER

Send for Free Book

"The Towmotor Fork Lift Truck and Tractor Guide" which describes all Towmotor Standard Products and shows how Towmotor Fork Lift Trucks can save space in your plant.

WHY ENLARGE YOUR PLANT while there's plenty of space *overhead* that can be put to work with Towmotor Mass Handling? Systematic storage of raw materials, equipment and products in this unused overhead area will free valuable floor space for productive work. High stacking all types of materials and products with Towmotor Fork Lift Trucks and Accessories can save space in your plant, expedite handling operations in and out of storage. Check the advantages of Towmotor Mass Handling now.

TOWMOTOR CORPORATION
Division 8, 1226 East 152nd St., Cleveland 10, Ohio
REPRESENTATIVES IN PRINCIPAL CITIES

TOWMOTOR Fork Lift Trucks *and* Tractors

THE ONE-MAN-GANG

MAY, 1948
VOLUME 3, No. 8

Flow

COVER PHOTO—George T. Christopher, President and General Manager, Packard Motor Car Co., Detroit, who discusses two vitally significant points in this month's guest editorial. See page 19.

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Two Ways to Reduce Your MATERIAL HANDLING COSTS

1

KEEP BATTERIES PROPERLY CHARGED

with Federal's Industrial Truck Battery Chargers

Fully automatic operation, with simplified controls, assures *correct charging*—which means longer battery life and increased load-handling capacity for your industrial electric trucks. Two-rate, 8-hour charging for lead batteries — controlled 7-hour charging for Edison batteries. Powered by Federal's long-life, quiet operating Selenium Rectifiers

- **Dual-Purpose Charging**
- **High Efficiency**
- **Long Life**
- **Low Power Costs**

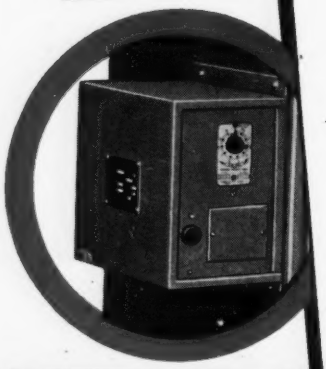
2

MAKE YOUR FEDERAL CHARGERS DO DOUBLE DUTY

with Federal's Automatic Charge Recycling Control

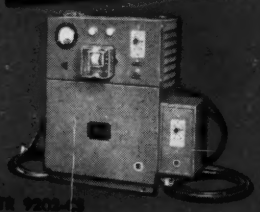
Available for use with all standard Federal Industrial Truck Battery Chargers. Enables *one* charger to charge *two* batteries, automatically, in sequence—at a *single* setting of the controls. Practically *doubles* the effective output of your charging equipment. Keeps an *extra* battery fully charged at all times.

- **Assures Maximum Return on your capital investment**
- **Charges 2 Batteries, in sequence, at 1 setting of the controls**
- **Reduces Charging Costs by Saving Man-Hours**
- **Easy to Operate**



THERE'S A FEDERAL CHARGER FOR PRACTICALLY EVERY JOB

Whether your fleet of battery-powered trucks is large or small, there's a standard Federal charger that will suit your current requirements. The three shown here are typical of Federal's complete line. Write Federal today for complete information. Dept. E-567.



FTR 9203-AS
Charges 150 to 250 Ampere-Hour lead or Edison Batteries

FTR 9189-AS
Charges 300 to 500 Ampere-Hour lead or Edison Batteries

FTR 9343-BS
Charges 450 to 1000 Ampere-Hour lead or Edison Batteries

FTR
An IT&T Associate

KEEPING FEDERAL YEARS AHEAD... is IT&T's world-wide research and engineering organization, of which the Federal Telecommunication Laboratories, Nutley, N. J., is a unit.

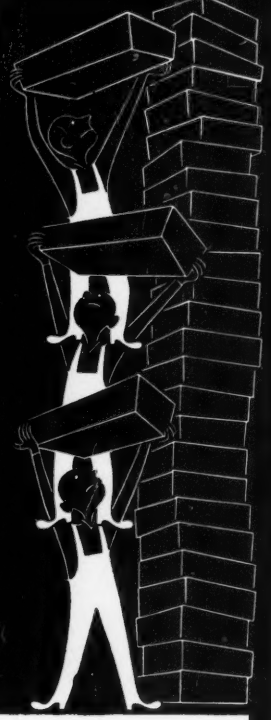
Federal Telephone and Radio Corporation

SELENIUM and INTELIN DIVISION, 900 Passaic Ave., East Newark, New Jersey

In Canada:—Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors:—International Standard Electric Corp. 67 Broad St., N. Y.

NO! NO! NO!

GET A YALE TRUCK



High stacking material with Yale Trucks not only lowers your cost per ton of material handled—it doubles or even triples your floor space. With a Yale Electric High Lift Fork Truck, you can stack multiple units (not just one at a time) ceiling high, with no effort at all.

Yale Electrics run from 1,000 to 60,000 lbs. capacities, in models to fit your needs. Most complete line in the world.

Consult telephone directory for local Yale representative or, send for new Catalog K-T. The Yale & Towne Mfg. Co., 4568 Tacony St., Philadelphia 24, Pennsylvania.

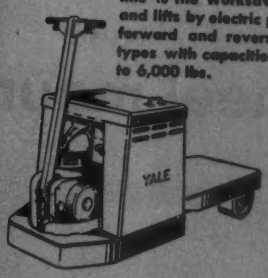
TOOLS THAT KEEP INDUSTRY "ON THE MOVE"

YALE

SCALES
HAND AND ELECTRIC HOISTS
HAND LIFT AND ELECTRIC TRUCKS

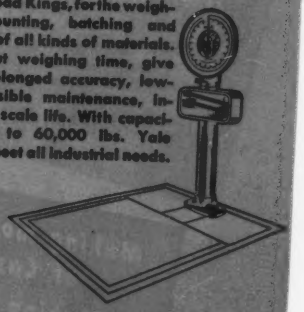
"ON THE MOVE" WITH YALE

EXCLUSIVE AIR-COOLING DESIGN of the Yale Cable King Electric Hoist eliminates excessive brake heat; gives you more lifts per day. It is the only hoist equipped with a load brake with positive lubrication. ¼ to 12 tons capacities.



NEWEST ADDITION to the Yale line is the Worksaver. It travels and lifts by electric power. Has 2 forward and reverse speeds. 7 types with capacities from 1,000 to 6,000 lbs.

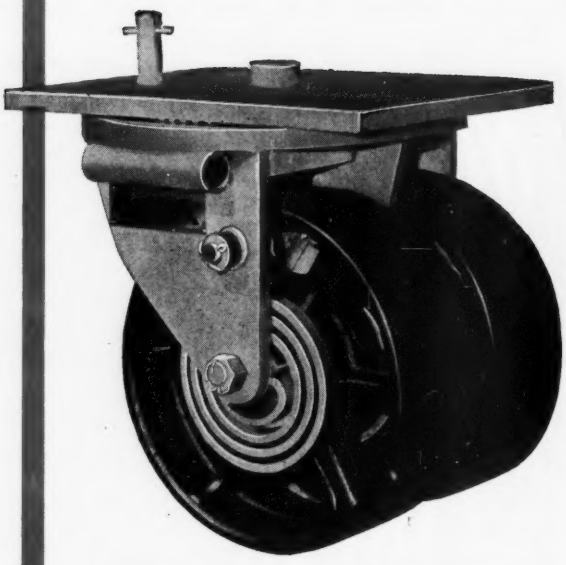
HANDLING MULTIPLE LOADS with less effort is routine for Yale Hand Lift Pallet Trucks. Wide range of models. Multi-stroke; mechanical and hydraulic lift. Capacities up to 6,000 lbs.



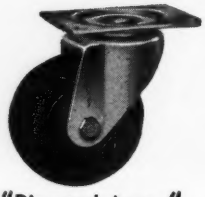
YALE OFFERS NEW SCALE LINE —The Load Kings, for the weighing, counting, batching and testing of all kinds of materials. They cut weighing time, give you prolonged accuracy, lowest possible maintenance, increased scale life. With capacities up to 60,000 lbs. Yale Scales meet all industrial needs.

Bassick Casters

wheels and wheel mountings



18" Double Wheel Floating-Hub Giant
Weight, 675 lbs.



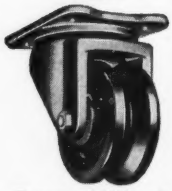
"Diamond-Arrow"

"Little Giant"

"Silent Steel"

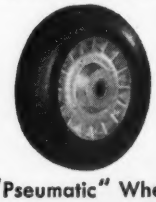
Trailer

Pipe Socket



Grooved Wheel

The "Airliner"



"Pseumatic" Wheel

A size and type for every materials handling problem

The casters illustrated are only a few of the many types designed to fill your needs. For all types of casters and wheels, or engineering help with special materials handling problems, write to caster headquarters: THE BASSICK COMPANY, Bridgeport 2, Conn. Division of Stewart-Warner Corporation. *Canadian Division:* Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ont.

Making more kinds of Casters... Making Casters do more

Bassick

"When we figured *ALL* costs, we settled on *ELECTRIC TRUCKS.*"

"Yes, Jim, we once slipped on that one, too . . . comparing price-tags only . . . when buying industrial trucks. But a check of overall costs opened our eyes to the real story. 'Matter of fact, on our battery-driven trucks, savings in maintenance and power alone offset the price-tag angle . . . in a hurry! That's one of the reasons why we've settled on 'electrics'."

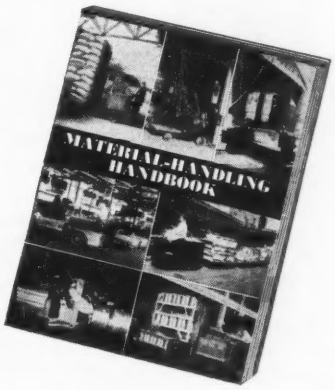
Familiar testimony from users who have made their own comparison of total costs. Others, who look beyond the price-tag before they buy, see top economy in basic and exclusive features of the electric industrial truck. For example:

LOWEST-COST ENERGY—electric power at ever-decreasing cost—and most reliable *for all industrial power requirements.*

SIMPLEST, STURDIEST CONSTRUCTION—the simplicity of electric transmission and control. The inherent stamina of E.I.T.A. Recommended Construction Standards—stamina that costs less than breakdowns in material flow.

UNEXCELLED PERFORMANCE RECORD—over 90% of the electric trucks sold in the past twenty years, to more than 300 fields of industry and distribution, *are still in constant service.*

These are some of the values behind the price-tag and behind the swing to *electric* industrial trucks.



SEND FOR THIS FREE BOOKLET

You will find tested, how-to-do-it suggestions for raising man-hour and machine-hour productivity—in the MATERIAL-HANDLING HANDBOOK. Your letter will bring it.

THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION

2928-L Forty-first Avenue • Queens Plaza • Long Island City 1, N. Y.

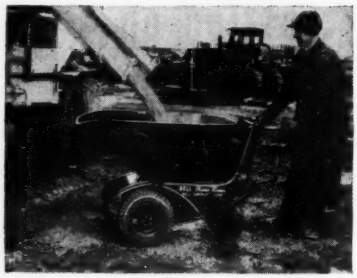
THIS IS

The BELL Prime-Mover*

A half-ton truck in performance . . . a wheelbarrow in economy

Allegheny Ludlum Steel uses the Prime Mover to haul foundry sand.

American Brake Shoe Company uses it to haul iron foundry scrap.



The Austin Company pours concrete mix with its Prime Movers.

● With it, one man can do as much work as a four-man wheelbarrow gang . . . faster . . . with less effort . . . at a fraction the cost.

Adaptable to any bulk materials . . . sand, gravel, dirt, concrete, grain, steel scrap. Equipped with platform, it hauls such things as electric motors, reels of wire, rolls of fabric or paper, concrete blocks, tile, brick.

With its blade, it smooths driveways, plows snow, grades lawns.

FEATURES:

- Takes half-ton loads up 20% grades.
- Bucket holds 10 cu. ft. . . . 18 with sideboards.
- Gear driven . . . no belts or chains.
- Fully enclosed engine protected against dirt and moisture.
- Clutch, engine, transmission all run in oil.
- Half-ton platform body available; also 50-inch "baby bulldozer" blade.
- Switch from bucket to platform without tools . . . in less than a minute.
- Turns in its own length (63½"); width 31½".
- 3-gallon tankful of fuel gives 8 hours continuous service.

And hundreds of other companies have found innumerable uses for this highly versatile "grandson of the wheelbarrow" . . . among them:

General Electric Company	Rockford Paint Company	Lima Locomotive Works
E. I. duPont de Nemours	Yates-Lehigh Coal Company	Schlitz Brewing Company
American Smelting and Refining	General Motors Corp.	Rose Hill Memorial Park
B. F. Goodrich Company	Consolidated Iron-Steel Co.	Michigan Food Supply
Republic Steel Company	Rutland Fire Clay Co.	Donner-Hanna Coke Company

SEND FOR MORE FACTS

Bell Aircraft Corporation
P. O. Box 1L5, Buffalo 5, N. Y.

Please send me facts on how the Prime Mover can be used profitably in my business. We are in the

.....(business).

Name.....

Company.....

Address.....

City, Zone & State.....

A PRODUCT OF BELL *Aircraft* CORPORATION

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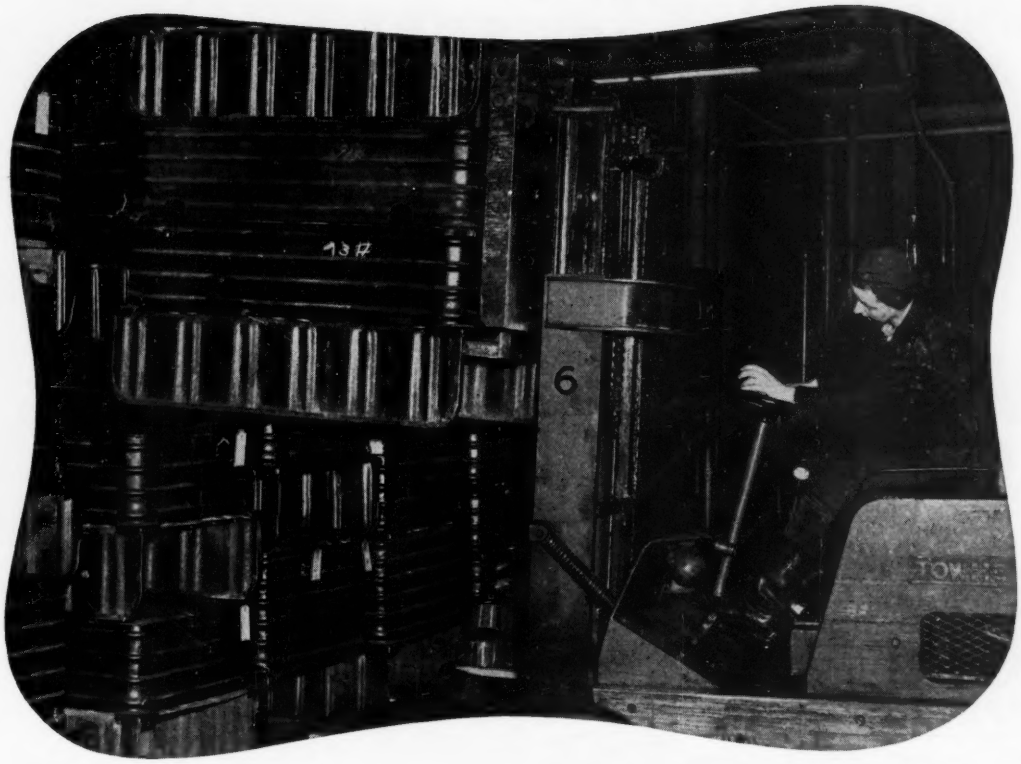
Savings, tier by tier!



Cut handling costs with UNION METAL *Engineered* Materials Handling Equipment

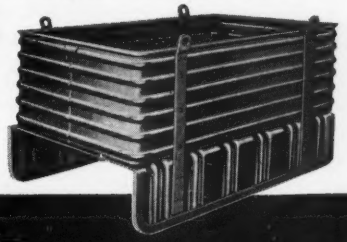
CUT your "overhead" by putting your "overhead space" to work—with the help of Union Metal steel skids, boxes and pallets.

The picture above shows a typical example. Union Metal skids and detachable tiering boxes combine to make tiering skid-boxes. Varied depths are obtainable by placing box on box. The skids also may be used alone. Storage space can be used more effectively and efficiently.

You gain extra benefits in reduced handling costs and increased profits because Union Metal units—

Keep floor space clear for production needs . . .
Increase production line efficiency . . .
Move materials quickly, safely, in unit loads.

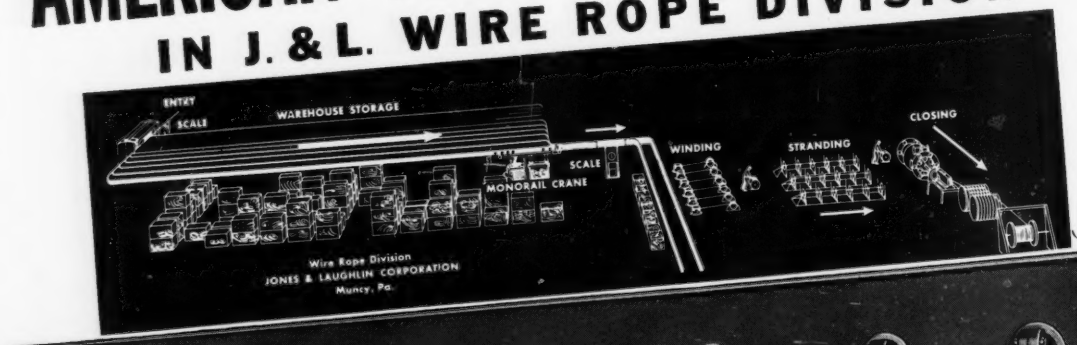
These rugged, long-lasting corrugated skid platforms, boxes and pallets *serve* and *save* in hundreds of industrial plants because they're engineered for the job intended . . . because they're built by Union Metal, specialists in steel fabrication for over 40 years. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

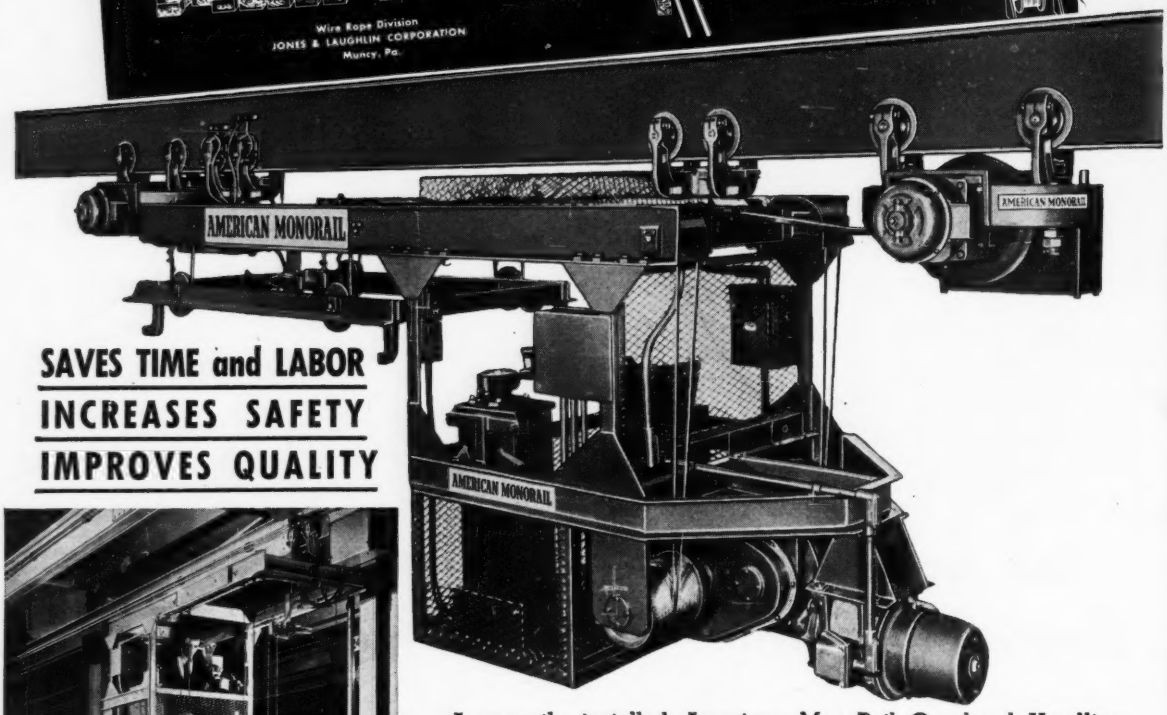


UNION METAL
Materials Handling Equipment

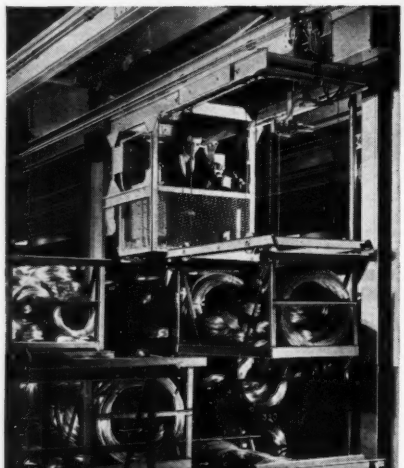
AMERICAN MONOTRACTOR CARRIER

IN J. & L. WIRE ROPE DIVISION





SAVES TIME and LABOR
INCREASES SAFETY
IMPROVES QUALITY



Operator of MonoTractor Carrier can deposit or select racks of wire at any spot in the warehouse.

A recently installed American MonoRail Overhead Handling System at the Wire Rope Division of Jones & Laughlin Steel Corporation not only saves time and labor, but also increases safety and improves quality of production.

All manual lifting of coils has been eliminated. Coils loaded in special racks are stacked three tiers high in the warehouse. Operator of MonoTractor Carrier has access to all racks for quick transfer of coils to the winding reels. Labor requirements for materials handling has been substantially reduced. Injuries from lifting have been almost eliminated. Stoppage caused by wire kinks and other damage when handled manually have been reduced by overhead handling.

Let an American MonoRail Engineer show you that automatic handling pays and saves.

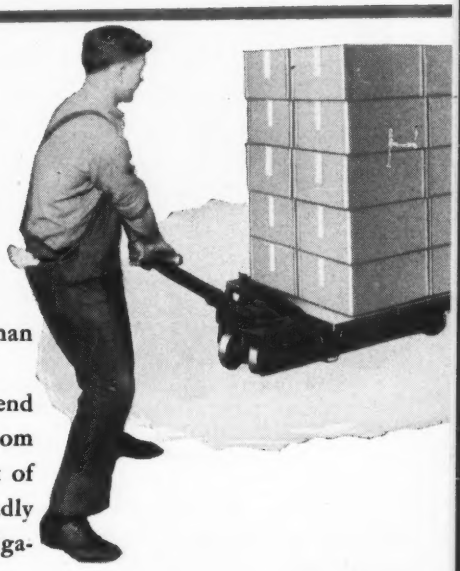
THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE **CLEVELAND 7, OHIO**

Trapped?

...by High Handling Costs?

These tangled lines enable the camera to reveal the time and effort consumed in shifting castings from floor to platform truck. Light bulb attached to man's wrist records an actual picture of the wasted moves.



free yourself with the time-saving

BARRETT SYSTEM!

Don't let waste motion trap you...like it does in so many handling operations! Look how the camera portrays dramatically the wasted time and effort involved in repeated loading and unloading—piling and unpiling.

Barrett Lift-trucks and Skids change all this. The loads stay on the skids—always ready to roll with a sweep of the Lift-truck handle. Thus, handling is placed on a quicker, easier and far more practical basis... where *one* man does the work of 3 or 4.

See how the Barrett System can end waste moves for you . . . from room to room, floor to floor, in and out of storage. A Barrett engineer will gladly show you how, without cost or obligation. Write...

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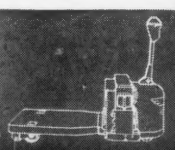
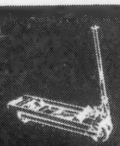
It's yours for the asking—the Barrett Junior Catalog.

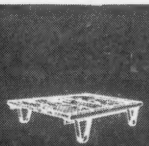
BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT



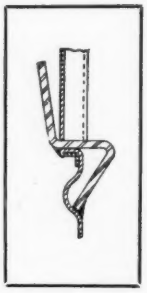
Barrett Handling Equipment



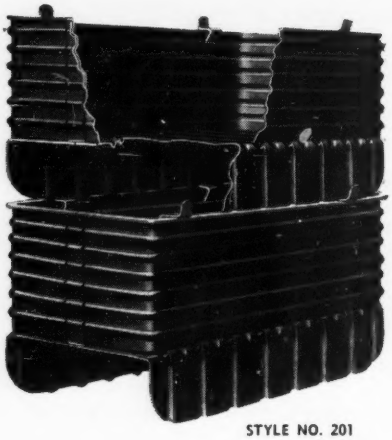


POWELL PRESSED STEEL
TIERING AND CRANE TIERING BOX PLATFORMS

This supplementary sketch shows the detail of the POWELL Tiering Lug. Each lug provides ample bearing surface, thus facilitating the stacking of units. Lugs are securely arc welded as shown and so arranged that the load stress is carried vertically by sides of box and legs of platform.

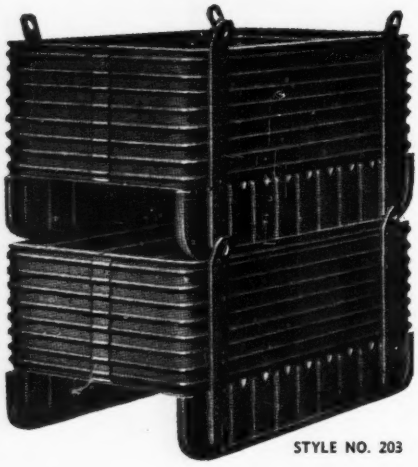


By the use of POWELL Tiering lugs this Box Platform allows use of full size box, thus giving greater cubical capacity.



STYLE NO. 201

EXTRA HEAVY DUTY CRANE TIERING WELDED BOX PLATFORM



STYLE NO. 203

A welded Box Platform equipped with long crane lugs and bumper channel runners to meet extreme conditions where extra sturdy construction is necessary. The long crane lugs, which are securely riveted to box and platform, carry the load of the unit from the platform instead of from the box.

CASTER EQUIPPED BOX

Here we have a standard two-piece box equipped with either swivel or stationary casters bolted to pressed steel channels. This provides a live box for handling materials which can be moved by power lift trucks or by hand. This type of box can be made with casters bolted to a plate on the bottom of the box, eliminating channels for use where only a live box is needed.

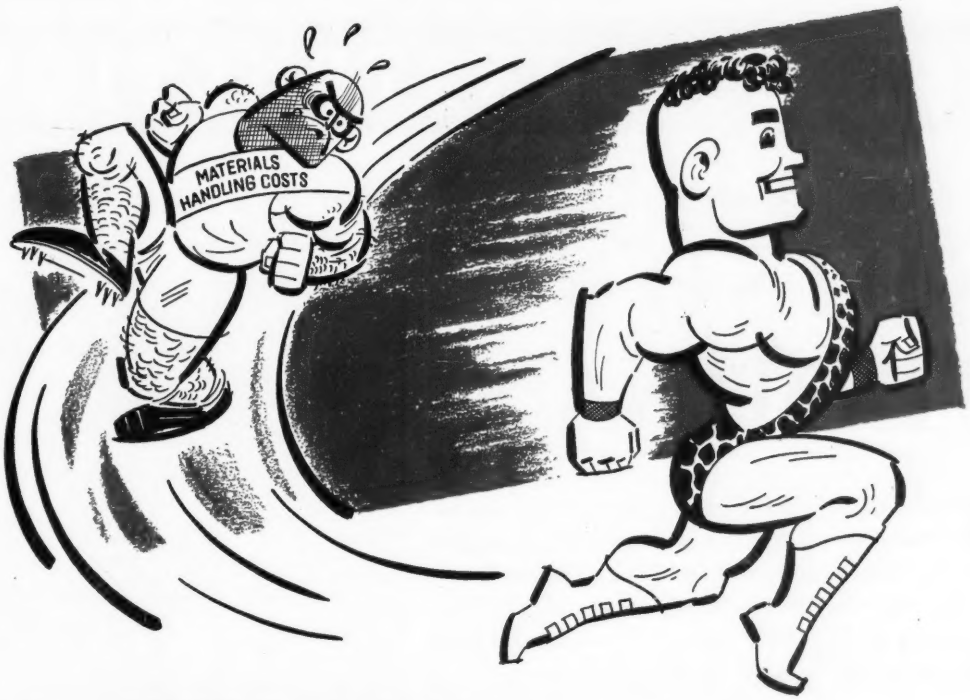
STYLE NO. 309

Other Designs of Caster Boxes can also be furnished.

Representation in Principal Cities

THE POWELL PRESSED STEEL CO.—HUBBARD, OHIO

"ORIGINATORS of Cold Formed All Steel Handling Equipment"



The MIGHTY MIDGET sets the pace for LOWER MATERIALS HANDLING COSTS

It's a tough race—but if you can beat material handling costs, you're in the money. Every dollar you save on handling expense goes straight into *profit.*

True, you say—*but how?* The answer is simple. When MOBILIFT (affectionately called the "Mighty Midget" by thousands of users) takes over in your plant, your profit and loss statement shows the score from the start. One advantage alone—the fact that MOBILIFT has no gears to shift—results in tremendous savings. Labor works with less fatigue and greater safety. You save space and eliminate rehandling. There is a big increase in the tonnage of materials moved and stacked per day.

MOBILIFT specialists have proved these savings to countless firms whose handling costs were out of range. All we ask is a chance to show you how "The Mighty Midget" can set a new pace for cost-saving in your factory or warehouse. Your signature on the coupon below can save you thousands of dollars in a few months. Send it in today!

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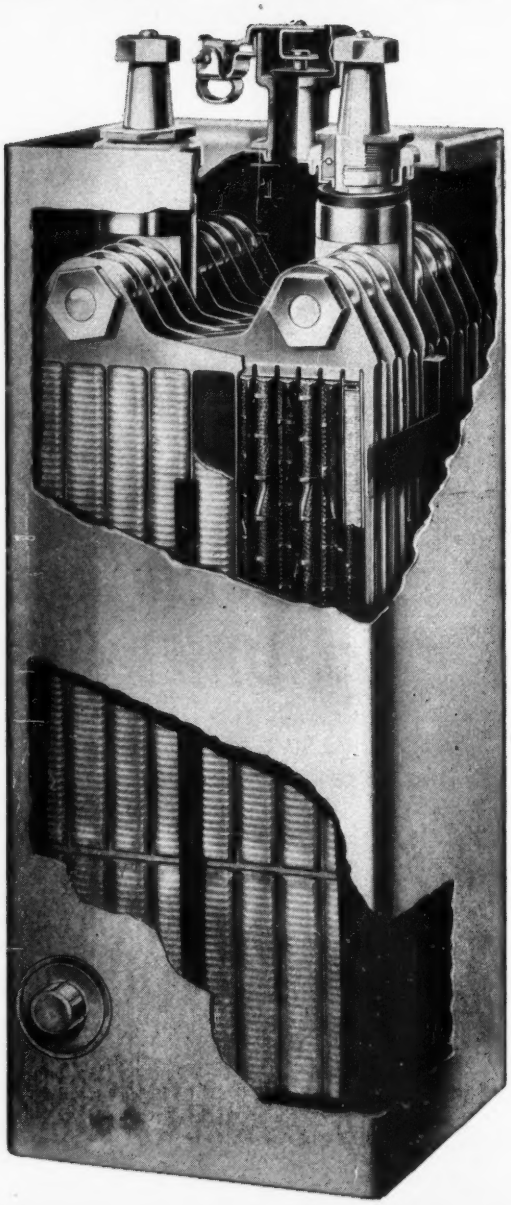
MOBILIFT
"The MIGHTY MIDGET"

STEEL CONSTRUCTION

the "inside story" of
EDISON STAMINA



BUYING a new battery industrial truck? Planning to repower an old one? In either case you'll want to specify a battery that will stay on the job—out of the repair shop . . . one that will stand up under the shocks, vibration and hard usage prevalent in material-handling services.

EDISON Nickel-Iron-Alkaline Storage Batteries, known for nearly half a century for long life and dependability, are recognized for their rugged and durable construction. Containers, pole pieces and other structural parts are made of STEEL. Even the active materials are permanently locked in perforated STEEL tubes and pockets. These in turn are securely assembled into STEEL grids to form the positive and negative plates. The STEEL cover is welded to the container—proof that no internal trouble is anticipated for the normal life of the cell.

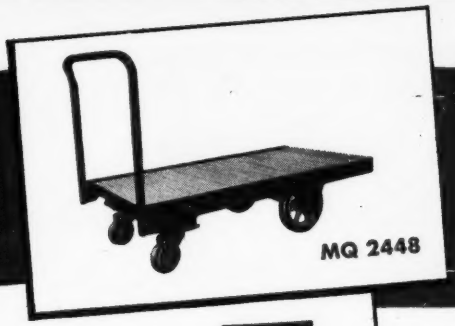
EDISON Batteries have been turned over, dropped off loading platforms and docks—*even down elevator shafts*—with little or no damage, and still delivered their full service life. The fact that they can withstand such accidents indicates the extreme dependability that can be expected from them under more normal conditions.

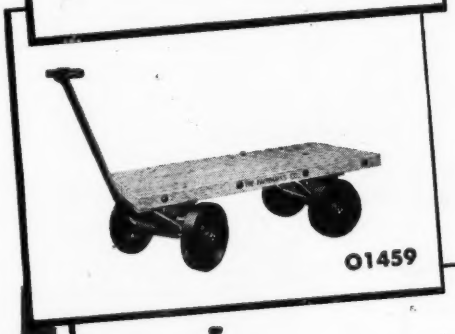
EDISON
Nickel • Iron • Alkaline
STORAGE BATTERIES

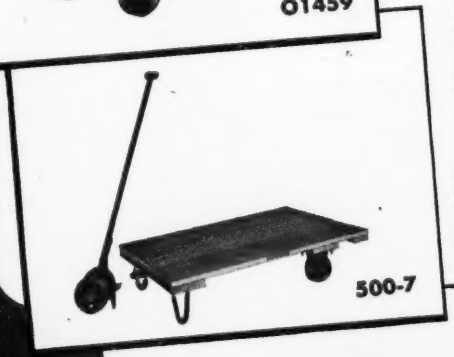
ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:

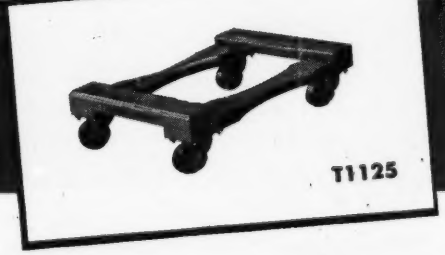
They are durable mechanically; can be charged rapidly; withstand temperature extremes; are foolproof electrically; can stand idle indefinitely without injury; are simple and easy to maintain.

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED, WEST ORANGE, N. J.
In Canada: International Equipment Company, Ltd., Montreal and Toronto









SPECIALLY DESIGNED TRUCKS? STANDARD TRUCKS?

get the advantages of both with fairbanks

Solidly based on years of on-the-job study and experience in all types of load-handling assignments, the standard line of Fairbanks Hand and Platform Trucks includes over 90 basic designs — developed to put the maximum possible speed and ease into 90 specific types of jobs.

With this unusually large variety to choose from, you can pick a Fairbanks Truck that will give you the job-design advantages you want, plus the savings in time and money that always go with standard equipment. For complete information about the entire Fairbanks line, or details about any specific truck, write The Fairbanks Company, 393 Lafayette St., New York 3, N. Y.; 520 Atlantic Ave., Boston 10, Mass.; 15 Ferry St., Pittsburgh 22, Pa.; 748 M&M Bldg., Houston 2, Texas.

MQ 2448. Commander Steel Frame Platform Truck. Hardwood platforms securely bolted between heavy angle irons; ends and sides armored to assure long life. Heavy duty, double ball bearing, semi-steel casters provide easy rolling and steering. Sizes 24″ x 48″ to 36″ x 72″.

S2742A. Commander Steel Frame Platform Truck. Identical in general construction features with the Q type truck, but is Tilting or Center Balance Type for quick turning in small space, around sharp corners, etc. Turns in its own length, pushes from either end. Sizes 27″ x 42″ to 30″ x 60″.

S4681. Factory Truck. Hardwood construction throughout, ball bearing swivel type casters. Balances on center wheels. A lightweight, durable, easy-to-operate truck that handles light, bulky loads with unusual facility. Wooden stakes are removable. Sizes 24″ x 48″ to 36″ x 60″.

O1459. Heavy Duty Wagon Truck. Capacity four tons. Extra strong construction throughout, including two 3″ x 1″ solid iron cross sills. Wheels are broad faced for easier starting and rolling under full load. Sizes 36″ x 72″.

500-7. Lift Jack Platform Truck. Lifts and rolls easily with heavy loads. Ideal for small spaces, eliminates many handling processes. Powerful jack operates by merely pulling handle down. To remove jack, handle lifts up, jack rolls out. Size 30″ x 48″.

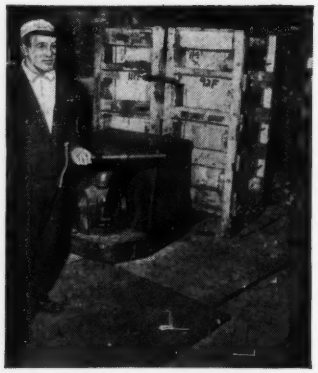
T1125. A rugged wooden frame dolly with side bars shaped to conform to the hand. Four ball bearing swivel casters. For quick, easy handling of refrigerators, furniture, boxes, long cases.

American industry rolls on

fairbanks trucks

4968

YALE FORK TRUCK



YALE WORKSAVER

Battery Electric Trucks and EXIDE-IRONCLAD BATTERIES

Speed production . . . cut material handling costs

There are no material handling problems . . . and no bottlenecks . . . where time-saving, cost-cutting Battery Electric Trucks are on the job. Freight cars and trucks are more quickly loaded and unloaded. Goods in process move quietly and smoothly through the plant. Finished products are hauled safely to warehouse and tiered ceiling high.

Battery Electric Trucks lift, haul and stack loads of every kind and size. They assure smooth starting, powerful acceleration, accurate spotting and easy control. They withstand years of use and abuse . . . over 90% of those sold in the past 20 years are still in service. And the husky, Exide-Ironclad Batteries that give them power provide dependable full-shift performance, with long life and ease of maintenance.

Improve your material handling operations. Start Battery Electric Trucks and Exide-Ironclad Batteries working and saving for you.

Write for further particulars and FREE copy of Exide-Ironclad Topics, which covers latest developments in material handling and shows actual case histories.

DEPENDABLE

POWER

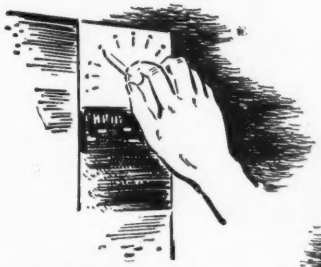
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

get 'em and forget 'em

GE BATTERY CHARGERS

G-E motor-driven battery chargers used for single-circuit equipment.

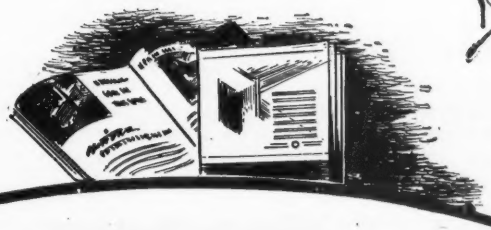
Standard, sturdy, G-E motor-driven battery chargers can now be ordered through your truck dealer: easily installed, automatically operated, and rapidly serviced. Good for years of trouble-free service in most cases, you can get 'em and forget 'em. For any industrial truck battery, for any number of batteries, there's a motor-driven charger. Ask your truck manufacturer for the new G-E charger bulletin, GEA-3923B or write the *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



EASY TO OPERATE Fully automatic from start to finish, protected against dirt and damage, compact, designed and manufactured for long life, G-E chargers meet E.I.T.A. Standard Specifications. Regardless of size, these chargers are economical to operate, supplying exactly the voltage and charging current required by each battery.

EASY TO SERVICE Should a charger need servicing, a phone call to the nearest G-E office will bring experienced help quickly. This prompt service avoids long delays in moving material. The G-E service shops are set up to handle all types of work on electrical equipment, and you can be sure of equipment as good as new when these services are used.

EASY TO ORDER Available only through truck manufacturers, this arrangement means you can get the most suitable charging equipment for your trucks, because the truck manufacturer helps you select it. You can also be sure of prompt delivery from stock. When it's G.E. we believe it's the best in design, materials, and workmanship.



NEW BATTERY-CHARGING EQUIPMENT AVAILABLE THROUGH YOUR

Truck Dealer

KEEP EM ROLLING WITH G-E CHARGERS

GENERAL GE ELECTRIC

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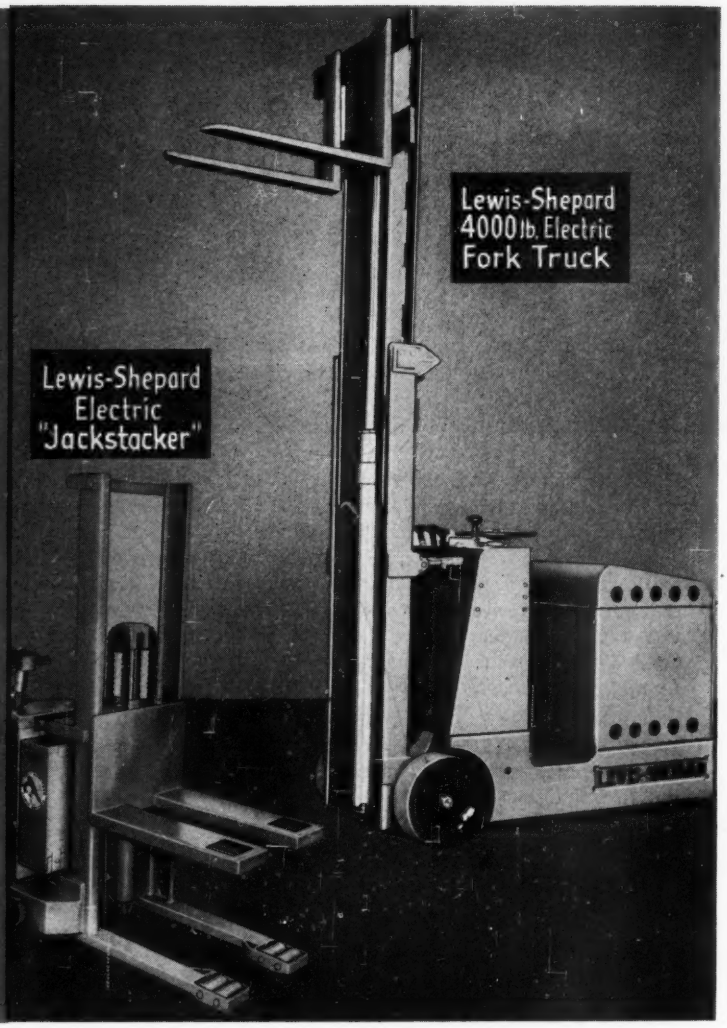
C&D Aircool BATTERIES

offer a cool guaranteed saving of 10% PER TON -or more!



Third largest manufacturer of industrial lead storage batteries

FOURFOLD INSULATION AND RETENTION

1. Vertical Fibre Glass Retainer
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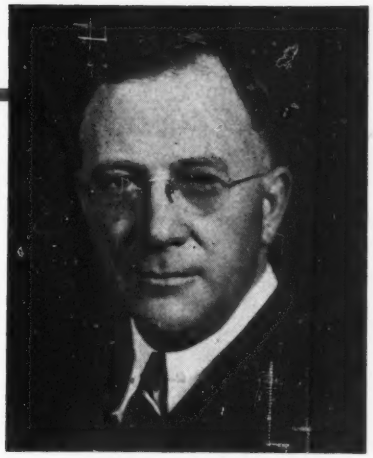
3. Perforated Hard Rubber Retainer
4. Microporous Rubber Separator

C & D Batteries Inc., Conshohocken, Pa.—*Building Better Batteries for more than 40 years*

HEAVY DUTY BATTERIES FOR ELECTRIC INDUSTRIAL TRUCKS • ELECTRIC LOCOMOTIVES • DIESEL LOCOMOTIVES
AIR CONDITIONING AND CAR LIGHTING • TELEPHONE • MARINE • AUXILIARY POWER
STARTING AND LIGHTING BATTERIES FOR MOTORCYCLES • AUTOMOBILES • TRUCKS • BUSES • INDUSTRIAL EQUIPMENT

Greater value for the consumer.... and a continuing study



By **GEORGE T. CHRISTOPHER,**
President and General Manager,
Packard Motor Car Co., Detroit.

AMONG the urgent needs of the manufacturing industry today is standardization of material handling methods between vendors and the manufacturer. Packard's $20,000,000 postwar expansion program has clearly sensed this need. And towards its solution we have worked progressively to achieve material handling co-ordination and standardization between our many vendors and our own plants.

In Packard planning, this standardization is a *must*. For, since the war we have expanded our plant capacity to a potential of nearly 1,000 automobiles a day. To most efficiently produce this number of Packard units, production planning is tied closely to and influenced by the problems of material handling.

For example, in our operation we must handle a broad variety of materials. We receive raw materials and finished parts; we must handle textiles, inflammable products, oils, lumber, glass, and many other commodities. Each of these is handled in a specialized way by the vendors from whom we buy. Thus, when the material reaches our gates in Detroit, we must be able to handle it in much the same manner as it was handled by the supplier.

This is where close co-ordination between vendor and manufacturer becomes a matter of prime importance.

Another important step in Packard's material handling program has been the establishment of numerous receiving departments. These departments are located so that the incoming materials may be received, inspected and stored in an area closely adjacent to where it will be used in assembly. In this way it is possible for us to keep our "float" of materials to a minimum, and thus eliminate large and costly inventories. Such material handling savings permit us to pass on to the Packard owner greater value for his money.

The variety of material handling equipment employed in our plants is tremendous. While we utilize the well-known floor type and overhead conveyors, many special items require special handling. For example, fitted railroad cars are used to transport Packard chassis from the supplier to our plants. Upon arrival, they are unloaded by especially equipped mobile cranes. The latter load the frames on specially built trucks, which then feed the chassis to our chassis "float" near the assembly lines.

Efficient material handling is a problem which enters into practically all businesses. But with us in the automobile industry, it is one of our *major* problems. Look at these figures: the weight of our current models is approximately 4,000 pounds per car. Add to this, scrap, shrinkage, and by-products of the finished product and we have a 5,000-pound item! Today, our plant potential is 1,000 cars a day. So, when we eventually hit peak production, one day's full output must handle some 5,000,000 pounds!

That is why Packard makes efficient material handling a *constant* and *continuing* study.

Geo. T. Christopher

Saved: 30% of investment in only one year

SECOND PRIZE WINNER IN 1947 FLOW CONTEST

PART I

This paper won the second prize of $300 in the 1947 FLOW Cost Analysis Contest. See the prize-winning papers beginning with the March issue. The second $1500 FLOW Contest is open. Write us for your entry blank now. Your paper may be a winner.

By CHARLES H. DAY

Assistant to General Manager,
Chicago Operations
Sherwin-Williams Co., Chicago

Tables A and B compare old costs with new costs.

TABLE A - OLD METHOD (UNITS PER MAN HOUR)	Average Daily Man Hours	Average Units Output - Daily: Cartons Handled	Cartons and Pails Handled	Drums Handled in and out of Stock	Cartons of Less than Case Lot Quantities Packed	Tons Shipped	Units Per Man Hour
Unloading Incoming Conveyor	64	4900					76.5
Handling Incoming Stock	128		6250				48.8
Handling Drums	24			110			4.6
Filling Orders - Case Lots	232		5900				25.4
Filling Orders - Less Than Case Lots	392(1)				825		2.1
Shipping - Less than Car or Truck Load	64(2)					55	.86
Shipping - Truck Load	24(2)					32	1.3
Shipping - Carload	56(2)					98	1.75
Non Productive Labor	48					185	3.85
TOTAL	1032						

(1) Includes maintaining open bin stocks, filling orders, weighing, checking and packing

(2) Includes checking as well as stowing and bracing where necessary.

TABLE B - NEW METHOD (UNITS PER MAN HOUR)	Average Daily Man Hours	Average Units Output - Daily: Cartons Handled	Cartons and Pails Handled	Drums Handled in and out of Stock	Cartons of Less than Case Lot Quantities Packed	Tons Shipped	Units Per Man Hour-New Method	Units Per Man Hour-Old Method
Unloading Incoming Conveyor	90	10100					112.5	76.5
Handling Incoming Stock	52		12950				250.0	48.8
Handling Drums	20			219			11.0	4.6
Filling Orders - Case Lots	131		9850				75.0	25.4
Filling Orders - Less than Case Lots	88				440		5.0	2.1
Shipping - Less than Car or Truck Load	98					127	1.3	.86
Shipping - Truck Load	7					46	6.5	1.3
Shipping - Carload	48					171	3.6	1.75
Non-Productive Labor	58					344	6.3	3.85
TOTAL	592							

THIS report covers cost reductions that have been made in the warehousing operations of a paint and varnish manufacturing concern, the savings amounting to $288,000.00 per year, which exceeds 30% on the investment required. The savings have been made possible through the use of material handling equipment in a newly constructed warehouse building which was designed for modern methods and equipment.

BACKGROUND—Physical Layout—Old Method

Here is a summary of the background which led up to the need for this new warehouse. During 1940, it became evident that a new plan of handling, warehousing and shipping finished paint products must be developed since there was not sufficient storage space available to handle the inventory requirements. Secondly, the cost of these operations had increased 63% above the cost figures of 1929 and represented 20.6% of the total cost of producing paint and varnish as compared with 14% in 1929. This increase was due in part to the fact that the physical set-up had passed the point of diminishing returns. That is, an increase in man power did not bring about an equal increase in output because of the congested conditions. It was quite obvious that storing materials in

numerous locations (involving multiple handlings) had to be eliminated if the cost of this part of the manufacturing process was to be brought back into line. Another factor was the rental cost of outside storage facilities, and service on orders was entirely inadequate to satisfy the requirements of the sales department.

Numerous manual operations were necessary in handling the finished goods from the factory through storage and shipping. The buildings for the most part were old, having low floor loads, narrow column spacing, and serviced by very poor elevators.

Cartons of finished goods were received from the factories on a conveyor, passed through a sealing machine and loaded on 4-wheel warehouse trucks for delivery to storage in adjacent multistoried buildings or to shipping platforms where they were to be transported to rented outside storage areas. Five-gallon containers were loaded on warehouse trucks at the filling points and the same procedures followed as in handling cartons; 55-gallon drums were hand trucked one at a time to yard areas where they were stored on their sides. Hand stacking meant loss of cubic space.

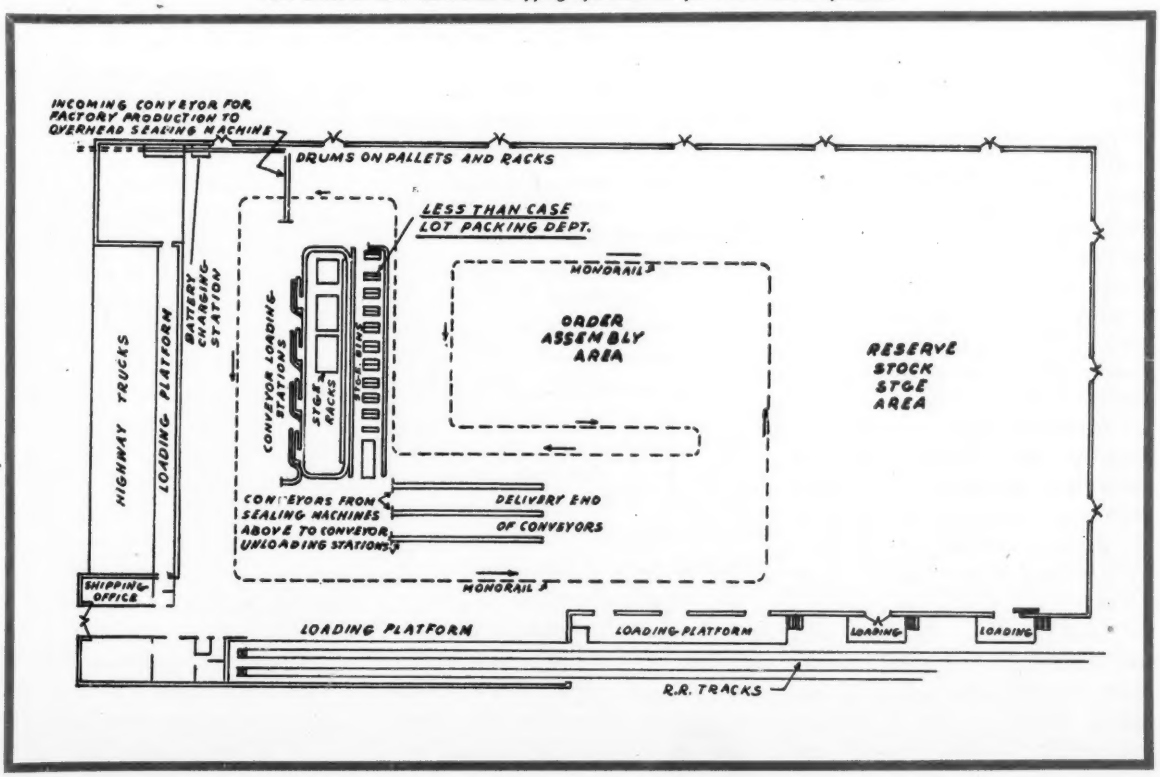
Orders for these materials vary in size ranging from less than a gallon to straight truck or carload lots, and almost all orders include both full-case and less-than-full-case quantities. Since approximately 800 orders were filled daily from the 6,000 to 8,000 different items normally carried in stock in several different buildings, it can be seen that the problem was quite involved. It was necessary to handle each package separately and from six to 15 times from the time it was filled in the factory, processed through the warehousing operations and shipped. Such a system, likewise, entailed a tremendous amount of clerical help in order to keep stock records and handle orders, with resulting delays in service and errors in shipment. It was imperative that costs be substantially reduced.

Operating Costs—Old Method

The existing costs of each operation had to be accurately determined so that they might be used as a basis for justifying expenditures for new buildings and equipment. For the purpose of this report, costs will be confined to labor costs as they represent 80% of the total operating cost. (Expense costs, excluding fixed costs on buildings, vary almost in direct proportion to the output handled.) Labor costs will be reported in man hours per day as there has been a substantial increase in labor rates over the period which is covered by this report, making dollar comparisons meaningless.

Table A shows, for the year 1940, the average man power distributed in man hours per day for each operation then in existence, together with the average output handled by each group. The payroll for handling material (excluding office and clerical help) represented approximately 129 persons. These costs were used as a basis

Flow sheet of new warehouse-shipping operation for paint and varnish products.



for justifying expenditures in new buildings and equipment.

Tables A and B, reproduced on these pages, show that man hours have been reduced 42.5 per cent, and the tonnage handled was increased by 86 per cent. With the old method, it would have taken 819 man hours more per day to handle the increased volume. Based on current day labor rates, this amounts to an annual saving of $288,000.00.

Requirements of New Handling Methods

It was determined by our order analysis, inventory analysis, and production studies that the new building must: (a) be approximately 200,000 square feet in area; (b) have a railroad siding large enough to accommodate an average carloading schedule of eight cars per day and a peak of 16 cars per day figuring on one track setting per day; (c) have truck loading space to accommodate 20 highway trailers at one time.

Other specifications were determined, such as proper amount of office space, washroom facilities, proper location with respect to proposed future building plans, room for expansion, etc. It was decided that a one-story building would be best for our purposes.

It was estimated that the proposed warehouse would be required to handle: (a) 12,000 incoming cartons and pails daily from local production facilities; (b) two incoming carloads from outside suppliers daily; (c) 1200 customers' orders daily; (d) 400 55-gallon drums daily; (e) shipping facilities for outgoing shipments of 160 carload tons daily, 100 truck load tons daily, 150 less-than-car or truck load tons daily, and (f) facilities for packing 1200 cartons of materials ordered in less than lot quantities.

These requirements show why the handling system had to be quite versatile. Each problem was taken separately and a method planned for it, after which all were put together in a master plan. A combination system using gravity conveyors, belt conveyors, live roll conveyors, fork truck and pallets, monorail conveyor, tractor trailer trains, hand lift pallet trucks, semi-live skids, and a complete intercommunicating system were finally agreed upon. Following is a summary of the equipment chosen for each type of operation.

The new warehouse was to be located on the opposite side of the street from the manufacturing departments. Because it was feasible to pack cans into cartons on a conveyor at the filling station, this conveyor system was extended over to palletizing stations in the new warehouse. Conveyors from all manufacturing departments were merged into one main line, which traveled through a tunnel to the warehouse. Here, the containers are switched into one of the several storage conveyors delivering to the carton sealing machine. At this point the pails are separated from the cartons and delivered direct to the conveyor unloading station.

Inbound Cartons and Pails From Local Production

The cartons and pails are then loaded on pallets which have been placed on hand trucks for delivery to various sections. These containers are also loaded on pallets which have been placed on the floor and are moved away from the immediate vicinity of the unloading station by motorized hand pallet trucks. A sketch illustrates the layout of the storage areas, conveyor systems, and other warehousing operations. The carton sealing machine was installed in the warehouse as this location would tie in with future plans for new paint manufacturing facilities.

The difference in co-efficient of friction made it impossible to obtain a degree of pitch in the gravity conveyor that would permit both cartons and pails to be moved at a safe rate of speed. Gravity conveyor was selected for lines which were to be used for moving cartons only, belt conveyor for trans-roller conveyor for moving both cartons and pails and also to provide temporary conveyor storage space. Along with this conveyor system, electronic controls were devised which would start and stop the lines automatically, time the intervals when each conveyor had been stopped, actuate signal lights at control points when the conveyor had stopped and also count packages for cost purposes.

Stock Handling

A fork truck and pallet system was decided as being most suitable for handling stock from the point where the conveyor was unloaded to stock, and where possible, from stock to the shipping floor. This type of handling system was chosen for the following reasons:

1. The maximum cubical content of the building could be utilized. 2. It lent itself to the handling of the various types of packages involved, namely, cartons, 5-gallon pails, and 55-gallon drums. 3. The flexibility of the system. 4. It permits the handling of load units.

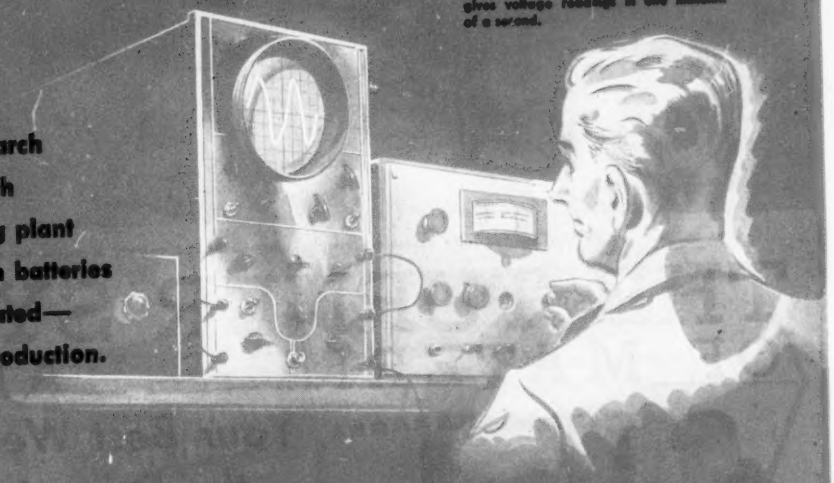
A number of other determinations had to be made. These were: 1. General method of handling. 2. Size and number of pallets. 3. Size and number of trucks. 4. Size and number of batteries. Each of these points is taken up separately.

Inasmuch as both large and small orders had to be handled and because less than five per cent of the number of items represented about 90 per cent of the volume, and since most orders called for some of the small-volume items, it was necessary to have *all* items accessible. An order assembly area was planned close to the shipping location (see flow sheet) in which at least a pallet load of all material would be stored. This area was laid out in a logical sequence to conform with a printed order blank, and the maximum amount of space was utilized by providing racks. Around this order assembly

(Turn to page 38)

Only GOULD Has It!

In the Gould Research Laboratory, a Cathode-Ray Oscillograph is being used for the first time in the battery industry. It gives voltage readings in one millionth of a second.



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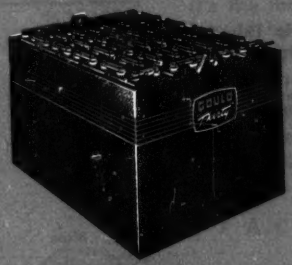

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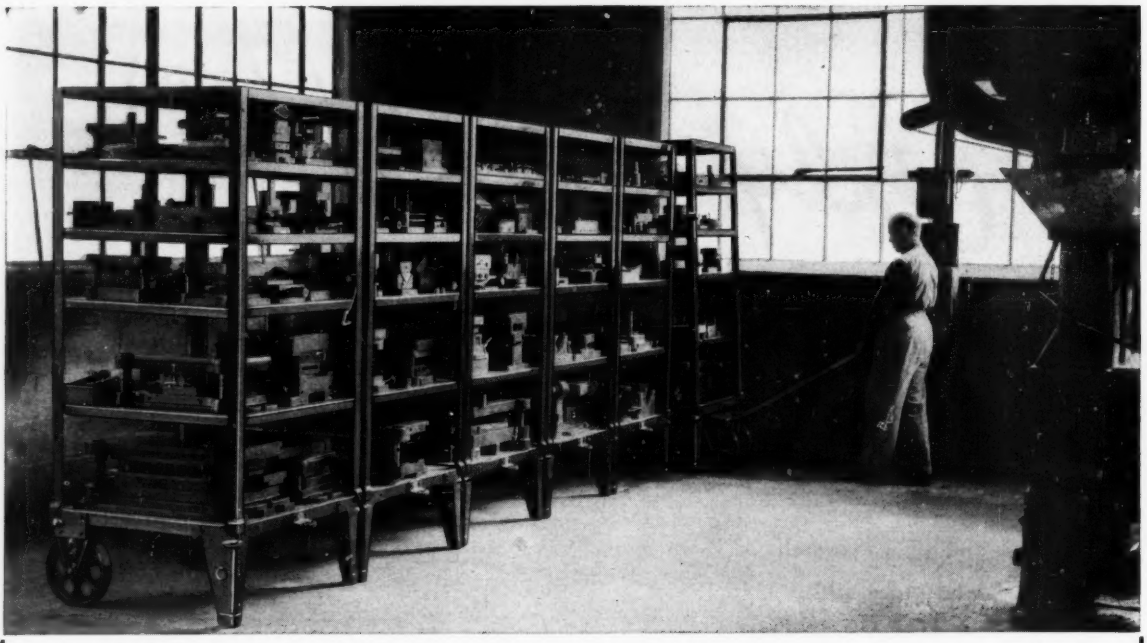

Dies on these Racks are always fully protected, visible, accessible and quickly movable by hand Jimmy or power equipment.

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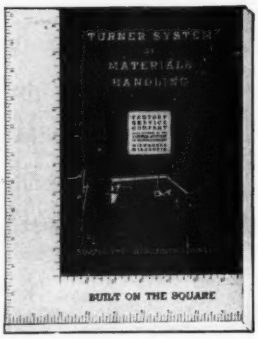

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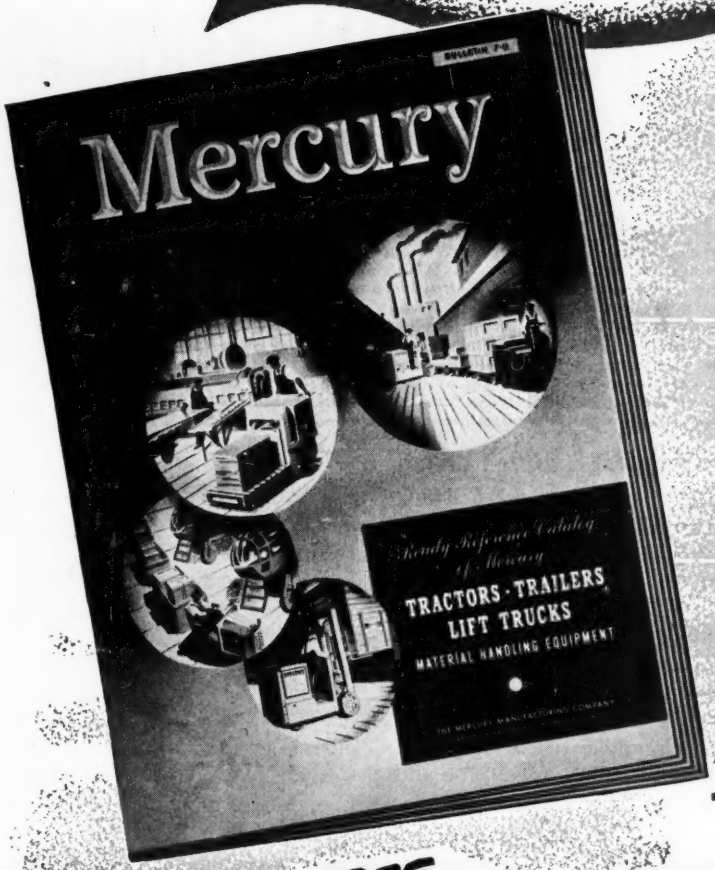
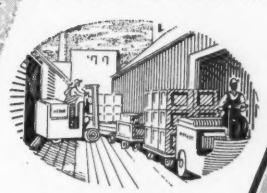
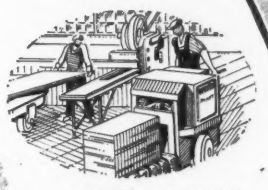




TRACTORS AND TRAILERS



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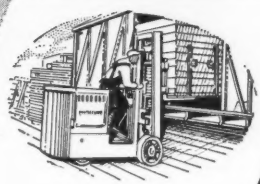

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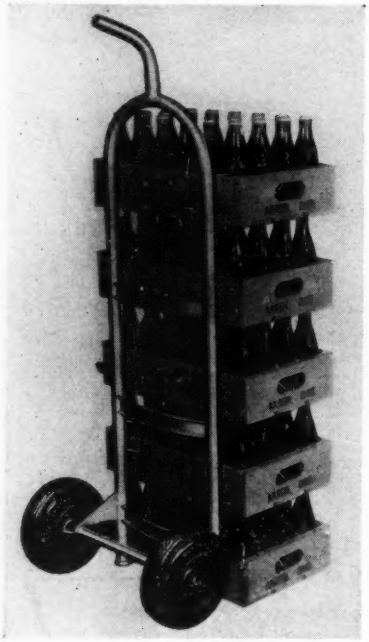
INDUSTRIAL PNEUMATIC TIRES ARE *Doing A Job* IN MATERIAL HANDLING



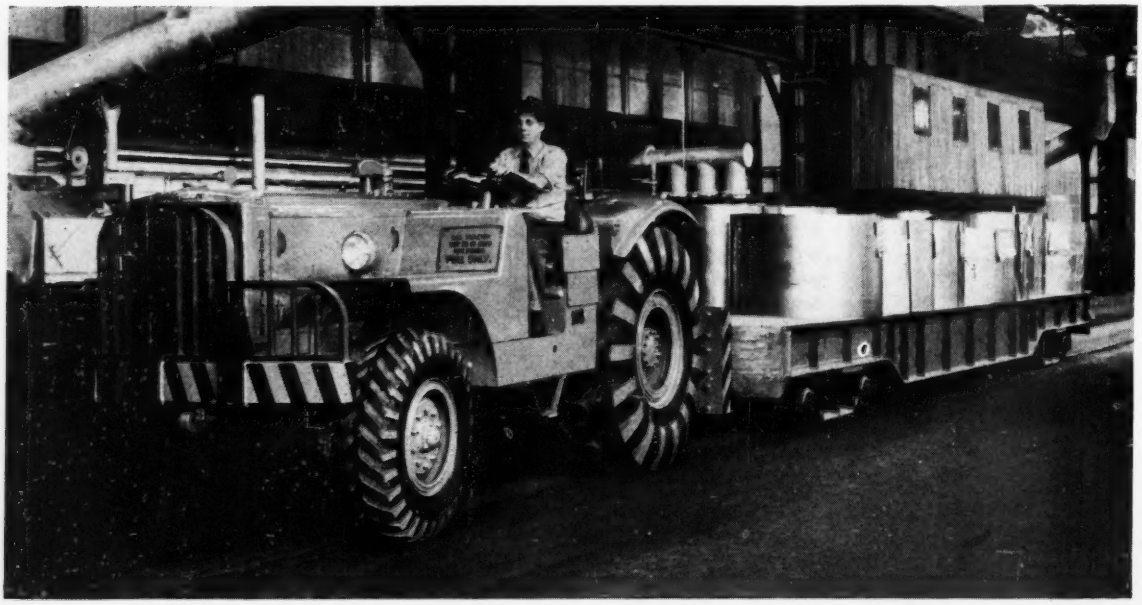
BOTTLED GOODS, relatively light loads, move safely on pneumatics.

PNEUMATIC-TIRED tractor, hauls 100,000 pound load of steel, over paved and unpaved surfaces.

Just as in the case of the automotive industry, pneumatic tires were applied to material handling equipment in order to provide flotation for loads in transit. This cushioning effect has several distinct benefits. 1. Heavy equipment rolls over cindered, unpaved or other rough terrain with relative ease. 2. Speed thus becomes an operating factor. 3. With shocks and jarring to material minimized, safety to loads results. 4. Quiet operations, another benefit, are often desirable from a production standpoint. 5. Maximum floor protection, even under extremely heavy loads, is afforded where pneumatic-tired equipment is used in "in-and-out" traffic. These and other advantages of pneumatics have accelerated their acceptance in recent years on the part of manufacturers and users alike. In turn, the wider application of this type of rolling surface to wheels has increased the operational scope and general usefulness of many types of load movers, both powered and manually propelled types.

AMONG the material handling equipment to which industrial pneumatic tires have, in recent years, been more extensively applied are two-wheel hand trucks, multi-wheel platform trucks, tractors, trailers, fork trucks, platform trucks, and powered and manually propelled wheelbarrows. Among the special applications are portable conveyors, dollies for boats and other long materials, monorail tractors hauling one or more load carriers, motor scooters, powered sweepers, floor markers, and other types of vehicles and accessories where tractive power and easy rolling are required.

Manufacturers of many lines of equipment are furnishing pneumatic tires as standard, others are offering them on an optional basis. Certain manufacturers are offering parts for converting present equip-



ment to pneumatic-tired wheels where this type of rolling surface is found desirable. Specific steps to follow in making such a conversion are given in a later section of this article.

General Considerations

As was pointed out in the February article on casters and wheels (page 22), the selection of the correct type of running gear is determined by proper consideration of such factors as (a) weight and character of load, (b) floor conditions, (c) operating conditions, (d) method of motivation, (e) traffic, and (f) special problems encountered in particular plants. With some modifications, the same rules apply to the selection of pneumatic tires. The February discussion, incidentally, was limited to single-unit wheels. Because of this, and because pneumatics are an important category by themselves, they were not included in the February article. It was felt that they merited this separate description.

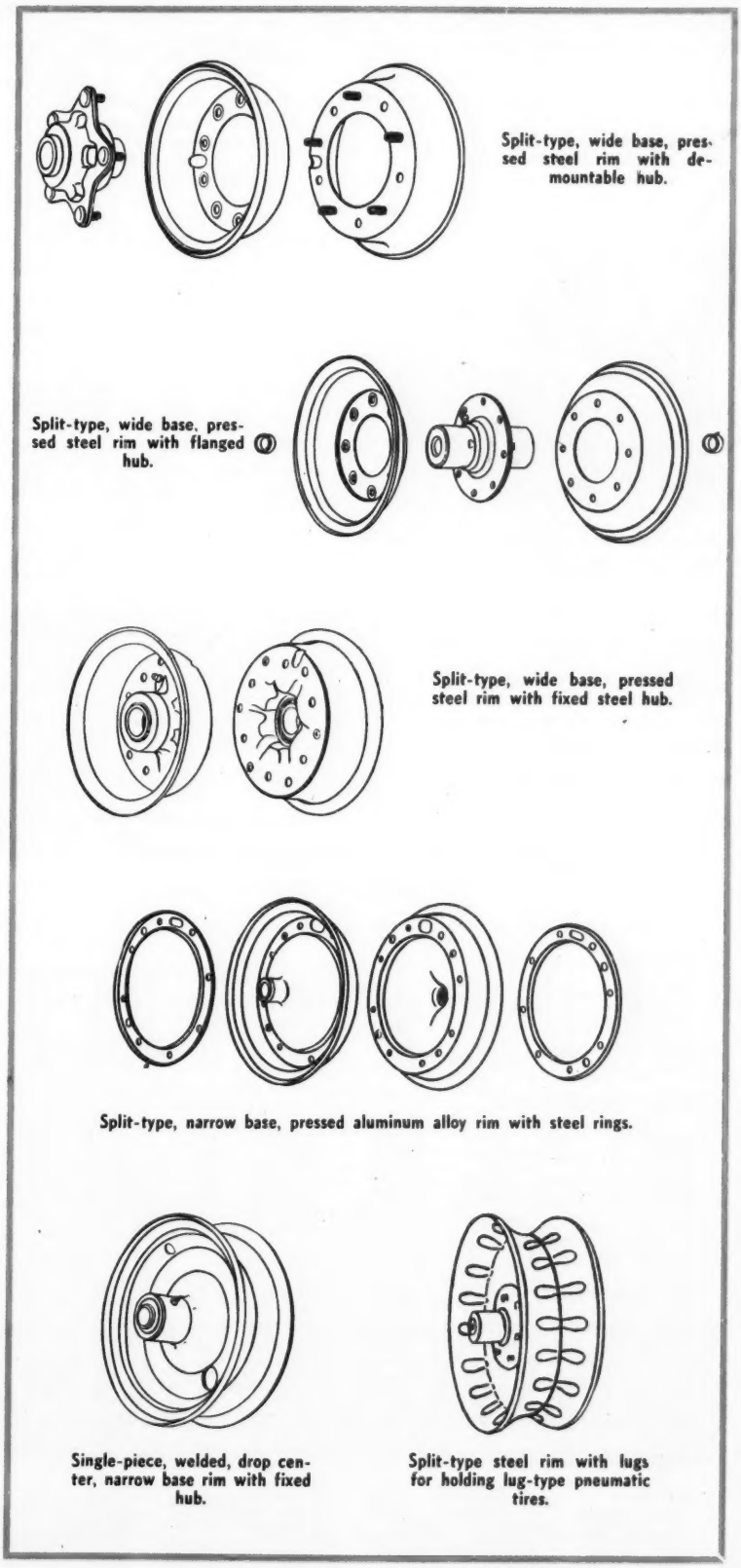
It is to be understood that in an obective discussion of this kind, whose purpose is solely of an informative nature, there is no place for a comparison of the relative merits of the various types of tires and wheels being offered. The prospective user should talk over his specific needs with the manufacturers' representatives, who will make recommendations on the basis of a prior survey.

Industrial pneumatics for material handling equipment break down into two separate types, which are described below. (Zero pressure or hollow center cushion tires were discussed in the February article and are therefore omitted here.)

Single Tube or Standard Tire

1. The single tube type, as the name implies, is a one-unit tire whose tube, outer casing and valve are integral. 2. The standard tire consists of the usual outer casing and separate inner tube.

The single tube tires, discussed first, are also known as the lug base type, because of their method of in-


Split-type, wide base, pressed steel rim with demountable hub.
Split-type, wide base, pressed steel rim with flanged hub.
Split-type, wide base, pressed steel rim with fixed steel hub.
Split-type, narrow base, pressed aluminum alloy rim with steel rings.
Single-piece, welded, drop center, narrow base rim with fixed hub.
Split-type steel rim with lugs for holding lug-type pneumatic tires.

GENERAL TYPES of wheels for use with industrial pneumatic tires are illustrated in this chart. Other types are available from manufacturers.

stallation on the wheel. They are available in sizes with load capacities up to 800 pounds per tire, and are primarily designed for light or medium service. The single tube tire is commonly used on

PNEUMATIC-TIRED crane ranges over paved drives and soft yard areas.

wheelbarrows and hand trucks in potteries, clay plants, nurseries, and similar places where the presence of puncture hazards is at a minimum and where fragile material must be cushioned against possible vibration or shock. Another large field of application is on platform trucks which move bulky goods subject to damage in intra-plant hauls. Platform trucks and trailers in the larger size, equipped with these pneumatics, are used for hauling loads of more than a ton.

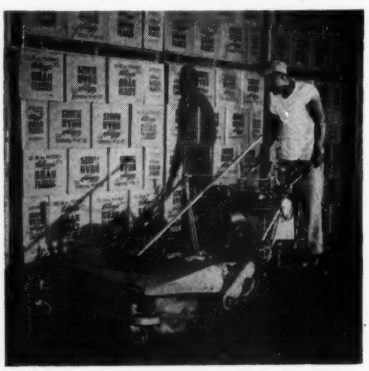
A third field of application, using smaller sized tires, is for hand trucks used in making deliveries to stores and homes. Familiar examples are beverage trucks rolling over sidewalks loaded with several cases of bottled goods. Another widely used type is the so-called refrigerator or household appliance truck, which has become standard equipment with dealers and drayage companies. The cushioning effect of such pneumatic-tired hand trucks affords maximum protection to breakable goods, thus minimizing loss through damage.

The principal deciding factors for the single tube type of pneumatic tire are size of load, low speed operation, nature of material and absence of puncture hazards. Because of the difficulty in repairing this type, new installations are limited as most users prefer straight side types which are easily repaired.

Straight Side Industrial Tires

These are produced for the full range of heavy-duty industrial requirements, with capacities up to almost three tons per tire. Also known as standard tires, these pneumatics vary in construction from two-ply to as many as 20-ply. The smaller tires are recommended for use at low speeds up to 10 m.p.h., but special tires are made in some of the larger sizes for high-speed operations such as on motor scooters, trailers and similar types of industrial equipment.

Because of their rugged construction, straight side tires are used in virtually any type of industry, including brick plants, concrete block and pipe plants, coal yards, steel mills, coal mines (low seam trac-



PLANT MAINTENANCE equipment moves quietly, protects painted floors.

The FIFTH Article in a Series

This article is the fifth in a series of comprehensive discussions of equipment which plays an important part in maintaining the flow of materials through American plants. Previously published articles include:

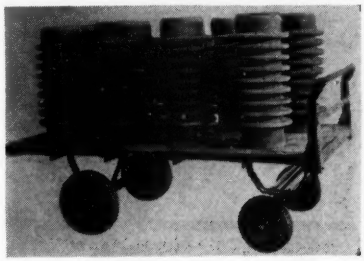
1. **How American Industry Uses MAGNETIC SEPARATORS.**
2. **American Industry Rolls on CASTERS and WHEELS.**
3. **Choosing the Right FLOOR TRUCK for the Job.**
4. **How American Industry Uses SCALES in Material Handling.**

INDUSTRIAL TRUCK MANUFACTURERS' SPECIFICATIONS

Make	Capacity	Weight	Drive	Ply	Trail	Ply
HYSTER CO.						
20 Lift Truck	2000	3550	6.00x9	10	6.00x9	10
40 Lift Truck	4000	5400	7.00x12	12	7.00x12	12
75 Lift Truck	7500	9800	7.50x15	10	7.50x15	10
150 Lift Truck	15000	15800	8.25x15	10	8.25x15	10
Karry Krane	10000	11400	7.50x15	10	7.50x15	10
ROSS CARRIER CO.						
19-HT-Lift Truck	6000	11500	7.50x15	10	7.50x15	10
18-HT-Lift Truck	10000	12750	7.50x15	10	7.50x15	10
16-HT-Lift Truck	12000	13100	7.50x15	12	7.50x15	12
15-HT-Lift Truck	14000	15500	9.00x15	12	9.00x15	12
			Or 10.00x15	14	10.00x15	14
CLARK EQUIPMENT CO.						
Gas Truc-Loader	1000	1960	4.00x8	6	4.00x4	6
Electric Loader	1000	2350	4.00x8	6	4.00x4	6
Plane Loader	3500	6555	6.50x16	6	6.50x16	6
Clarktor 6 Light	1800DB	3490	6.00x16	4	6.00x9	4
	2100DB		6.00x16	4	6.00x9	4
Clarktor 6 Mill 33	3000DB	3685	7.50x16	6	6.00x9	6
Clarktor 6 Mill 44	4000DB	4775	6.50x16	6	6.00x9	6
Transport	3500		6.50x16		6.50x16	
MERCURY MFG. CO.						
Huskie-6	3000DB	4000	7.00x16	6	6.00x9	6
Super Huskie	4000DB	6000	6.50x16	6	6.00x9	6
Type C Tractor			6.00x20		6.00x9	
TOWMOTOR CORP.						
LT-60	5000	8160	8.25x15	12	6.50x10	10

tors, for example), and many other operations where transport of loads is desired with minimum noise, shock, and where easy rolling over all types of roadways and floors is necessary. For example, a steel company uses trailers equipped with pneumatic tires for coil steel in loads up to 10,000 pounds. These heavy-duty trailers were specially developed for traveling over uneven terrain, both inside and outside the plant.

The resilience factor enters into countless situations met with under in-plant and yard traffic conditions. Flotation and the ability to absorb



GREEN POTTERY molds are moved safely because pneumatics absorb shocks.

shock are safety factors both for the load and the equipment.

Types of Rolling Surfaces

While pneumatic tires fall into two groups from a structural standpoint, the contact surfaces or treads are offered in a variety of styles. These are designed to meet specific operating conditions, as follows:

1. Ribbed tread. This is recommended for trail or free rolling wheels. 2. Non-skid tread is designed for traction wheels operating on average floor surfaces. 3. Studded tires are also designed for traction wheels but intended for equipment which is frequently used outdoors and where soft mud is encountered.

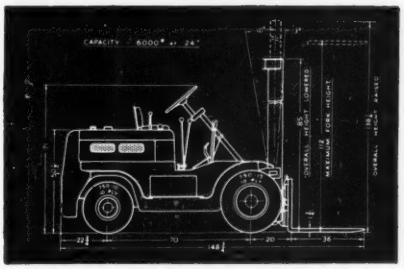
Since no tractive power is exerted by the free rolling wheels, the tires with ribbed treads are recommended as an aid to plant housekeeping. For instance, minimum pattern means that there will be no recesses for carrying mud and other undesirable material into the plant.

The non-skid tread, designed for traction wheels, exerts gripping ac-

MATERIAL HANDLING *News*

Here's **BIG NEWS!**

CLARK PRESENTS.. .....YARDLIFT "60"



a pneumatic-tired fork truck of 6000 pounds lift capacity, for the BIG jobs of handling the BIG, heavier loads under toughest, roughest conditions —a machine whose BIG-ness is matched by its BIG potential usefulness to Industry.

Does material handling in your business involve carrying heavy loads over rough, uneven, slippery surfaces, indoors or out?

HEAVYWEIGHT CHAMPION

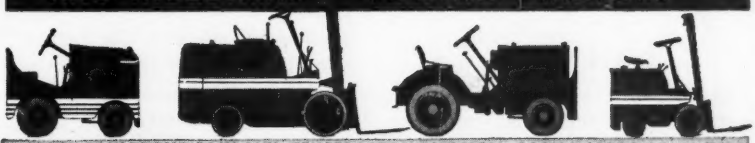
Here's the answer—Clark's YARDLIFT "60," for handling 6000-pound loads on pneumatic tires. This heavy duty machine completes Clark's pneumatic tired "team," developed during 1947—with the YARDLIFT "40" and the YARDLIFT "20," of 4000-lb. and 2000-lb. capacities respectively. Rugged, nimble, steady, these machines revolutionized and simplified many difficult handling operations, with sharp reductions of accidents.

DESIGNED FOR SAFETY

The YARDLIFT "60" has all the sound and practical features so conclusively proved by the performance of the YARDLIFT "40" and the YARDLIFT "20." Safety is of utmost importance in this field of handling; and the machine's two-wheel steering axle and dual-wheel drive axle with wheels widely spaced, provides maximum security. The pivoted steering axle mounting, a Clark development, enables the machine to carry its load evenly and safely while the tires follow smoothly the ups and downs of the ground surface. A special steering-gear ratio makes for easier operation; and the driver has a comfortable air-cushioned seat, easily adjustable and placed for good visibility.

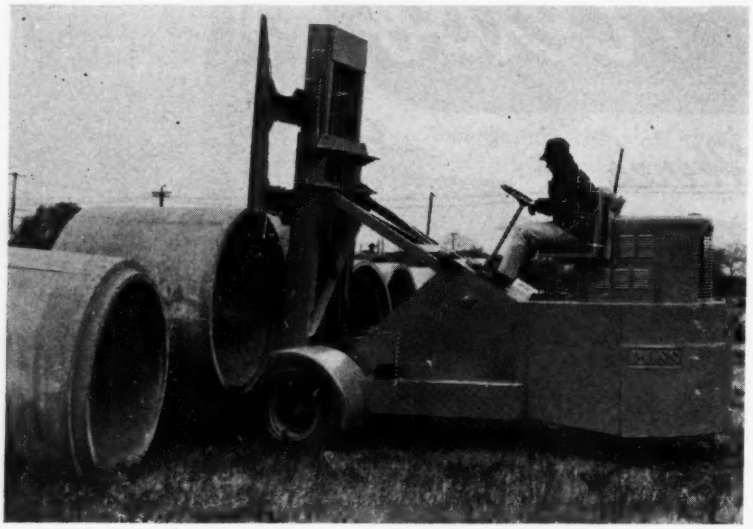
That your business may enjoy these advantages, talk things over with a Clark field engineer, a man trained to survey your operations and to make unbiased recommendations as to the equipment that will serve you most economically. CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED **FORK TRUCKS** AND INDUSTRIAL TOWING TRACTORS



CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 13, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

tion on average floors which may have some wet or otherwise soiled spots. The studded tread, the third type mentioned, is an enlarged form of non-skid tread to provide positive traction where extremely soft surfaces are encountered. These are found in many places where heavy-duty fork lift trucks, for example, yard or load huge sections of concrete pipe, around construction projects where similar equipment is used for lifting and positioning heavy members, as well as in lumber yards and many similar outdoor areas. In such operations, where extremely heavy loads are often handled without benefit of paving, sure footing spells safety to men and materials, as well as speedy performance of tasks. Thus non-skid and studded treads bring power economies by providing positive traction on difficult terrain or slippery surfaces that would otherwise retard work or offer hazardous obstacles.



GRASS COVERED section of concrete pipe yard offers no difficulties for pneumatic tires.

In some applications, it is necessary to go into the truck tire and off-the-highway type tire to handle the enormous loads involved in the operations.

Special Wheels

Special wheels for applying pneumatic tires to industrial tractors, trucks, trailers, etc., are available from most tire manufacturers. Special styles of wheels are available for both straight side and single tube tires. Wheels ordinarily come in two separate discs which are bolted together over the hub containing the axle bearing. It should be noted that bearings are available to fit various axles and hub lengths. Discs for single tube tires are indented so that "wells" are formed on the outside diameters (when the sections are bolted together). Lugs on the base of these tires fit into the wells and prevent slipping of the tire on the wheel when rolling. To reduce the dead weight of equipment, wheels of extra light metals (aluminum or magnesium, for example), can be obtained from certain manufacturers.

Converting to Pneumatics

Many powered and non-powered trucks can be adapted to changing conditions of flooring, loads and traffic by the installation of pneumatic tires. In making the change, three important factors must be considered. 1. Type of service. 2. Load per wheel. 3. Clearances available

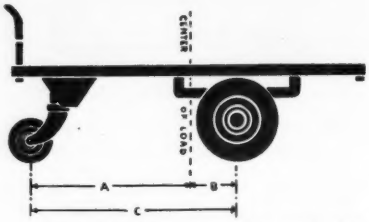
Traction wheels should be equipped either with the non-skid or studded tread tires, as explained previously, depending on the condition of surfaces where the equipment will operate. The size of the tire is controlled by the load which it must carry. This can be determined by one of two methods.

Where a floor scale is available, the front wheels of the loaded vehicle should be placed on the platform and a reading made. The process should be repeated with the rear wheels. The load per tire will then be the axle load divided by the number of wheels on the axle.

Where a scale is not available and the pay load and weight of vehicles are known, total weight on each axle can be determined by using the following formula and diagram:

$$\frac{A}{C} \times \text{Load equals Large Wheel Load}$$

$$\frac{B}{C} \times \text{Load equals Small Wheel Load}$$



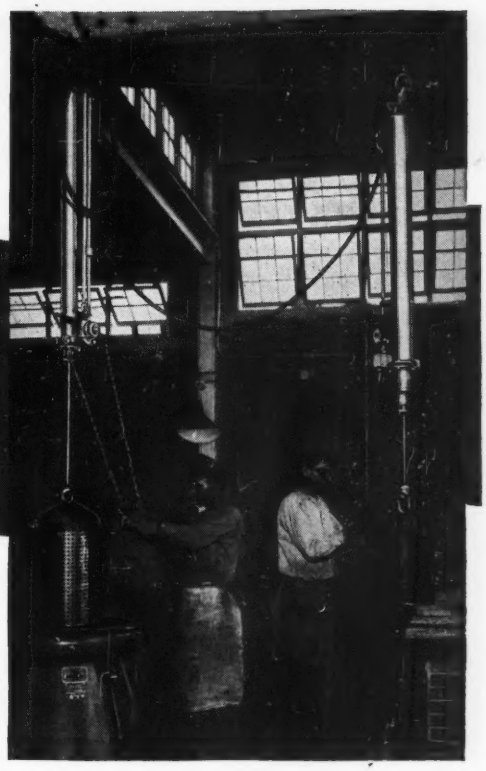
After the load per tire and the type of pneumatic tire have been determined, load specifications established by manufacturers should be consulted to get the right tire for the job *if clearances are satisfactory.*

In order to determine the largest size tire which can be used with proper clearance, four measurements should be made. 1. The tire diameter should have the same diameter as the wheel being replaced. 2. Tire ply rating and width should be ample to give adequate carrying capacity.

3. Adequate hub length must be available. If new hubs are shorter than originals, spacers can be inserted. Where new hubs are longer than originals, axles must be replaced by using cold rolled steel shafting. When offset hubs are encountered, it is necessary to measure from each end of the hub to wheel center. Since non-standard wheels are often expensive, it is cheaper, in many cases, to make truck design changes. (See page 32)

Get More Production Per Man with . . .

CURTIS AIR HOISTS



The speed, ease of handling and accurate control of Curtis air-powered Hoists and Cylinders step up production.

Wherever a lifting, pulling or pushing operation is involved, CURTIS Air Hoists save time and labor; cut load-handling costs.

Curtis Air Hoists provide:

- Low original cost
- One-man operation
- Immunity to abuse by overloading
- Capacities to 10 tons
- Light weight
- Lowest operating expense
- Finger-tip control
- Pendant, bracketed or rope-compounded types

Send for Bulletin C-7 on Curtis Air Hoists, Air Cylinders and Air Compressors.

CURTIS

PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1909 Kienlen Avenue • • St. Louis 20, Missouri
94 Years of Precision Manufacturing

CURTIS PNEUMATIC MACHINERY DIVISION *of Curtis Manufacturing Company* H-594
1909 Kienlen Avenue, St. Louis 20, Missouri

Please send me Form C-7 on Curtis Air Hoists, Air Cylinders and Curtis Air Compressors.

Name.....
Firm.....
Address.....
City.....Zone.....State.....

The LOAD DISPATCHER

A REMARKABLE TRUCK AT A REMARKABLE PRICE

The Load Dispatcher is adaptable to hundreds of material handling jobs around factories, foundries, warehouses, wharves, freight houses, etc., and will save time and money because of its unusually rapid and convenient handling. Its maneuverability and the ease of it amazes everyone who sees it for the first time. Nothing excels the Load Dispatcher for getting around where the going is tight. Its utter simplicity of design assures that it will require the very minimum of "time out" for attention and maintenance. From first cost on through its daily operation—fuel, labor, speed, maintenance—you will find that it contributes in full measure to economy of operation.

Load Dispatcher, one of a fleet of five saving its owners $100.00 per day, operating in a fertilizer factory with unusually cramped quarters for loading and transporting. Net load shown—2400 pounds.

You will be interested in the many unique, practical features of the Load Dispatcher. Write for catalog. *Some valuable territories open for distributors who can qualify.*

PRICED FROM
$465
F. O. B. INDIANAPOLIS

SCHWITZER-CUMMINS COMPANY
Material Handling Truck Division
1145 EAST 22ND STREET • INDIANAPOLIS 7, U. S. A.

4. Standard tire and wheel assemblies can be obtained to fit almost any axle. Odd sized or worn axles should be replaced for efficient service.

Care and Maintenance

Satisfactory service will be obtained from pneumatic tires if certain controls are exercised over gen-

POSITIVE TRACTION, indoors and outside, is insured by industrial pneumatic tires.

eral operating conditions. These precautions are inexpensive and will result in economies brought by long life of tires. For example, tires and runways should be inspected regularly to remove any sharp objects which might cause punctures. Overloading should be avoided to forestall failure. Regular checks of axle alignment and steering mechanisms on the vehicles should be made. Lubrication of equipment according to schedule will assure free rolling operation and reduce tire drag and skidding stops. Air pressure should be maintained at manufacturer's specifications.

Rubber has certain "natural enemies" such as oil, grease, gasoline or acids. These and excessive heat should be avoided.

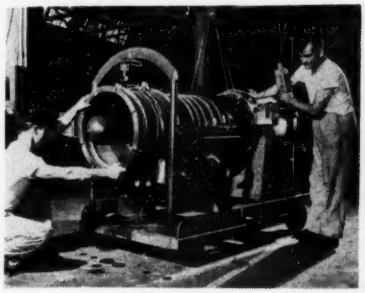
Sharp turns and quick stops should be avoided because these cause foreign objects to grind into the tread and bring rapid wearing. Travel areas should be marked at proper clearance to aid operators in keeping tires from brushing against curbing or other obstructions. To avoid strain on the sidewalls, loaded vehicles should not be permitted to stand in dead storage for long periods of time.

Thus, whether the load be bot-

(Turn to page 61)

ONE MOUNT— MANY OPERATIONS

Being lowered into a test truck with a tramrail one ton hoist is this Westinghouse "Yankee" turbojet aircraft engine. The test truck provides



a means of transporting engines to test cells and also acts as the engine support during test. This truck rolls onto a floor level floating platform in the test cell and is locked to the platform by two quick-acting tailstocks. The truck itself is equipped with two quick-acting tailstock type heads at the main engine supports so that only one bolt is required to mount engine in truck. Thus the engine can be quickly installed in the truck, pulled to test house by electric jitney, installed in test cell, tested, removed from cell, and hauled back to assembly floor, all with only one lift of engine.

THE BALANCED DRIVE HANSEN TACKERS

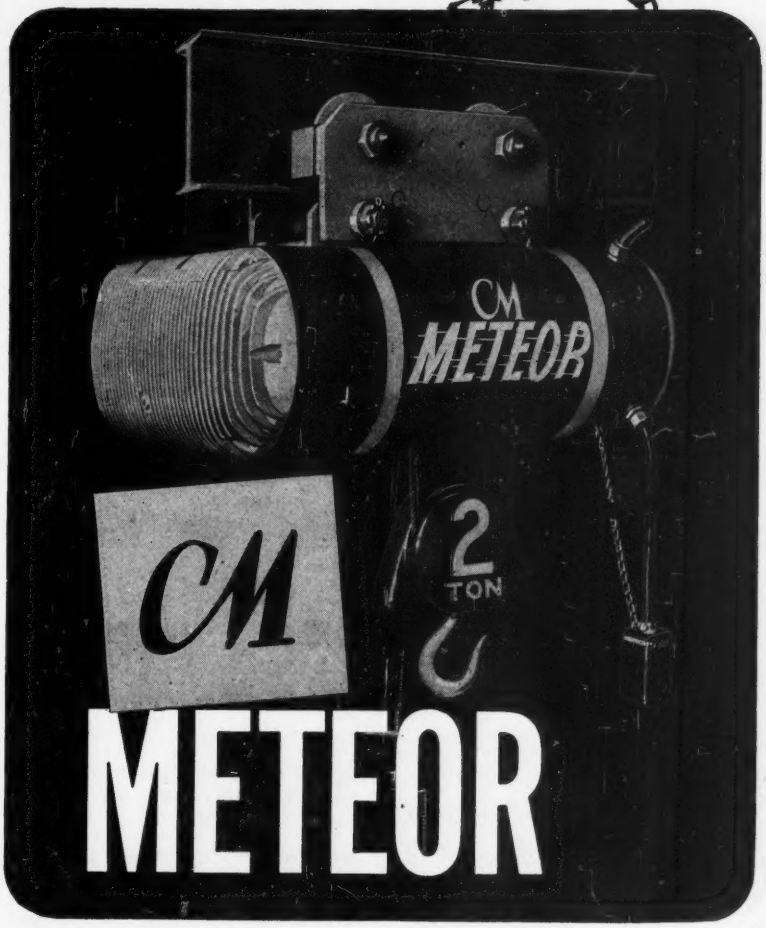
IT'S no trick with Hansen, with its *Balanced Drive*, to tack more labels or tags or line more boxes, in less time, with minimum effort, and keep shipments on the go.

Faster and safer than hammer and tacks—neater than glue with its goo—Hansen quickly and securely labels shipments, for neat appearance and safe arrival.

Alike in shipping, assembly or production, the zip-zip action of the Hansen Tacker, light weight and easy portability, speed up all kinds of jobs that require tacking or fastening.

A. L. HANSEN MFG. CO.
5010 RAVENSWOOD AVE. CHICAGO 40 ILL.

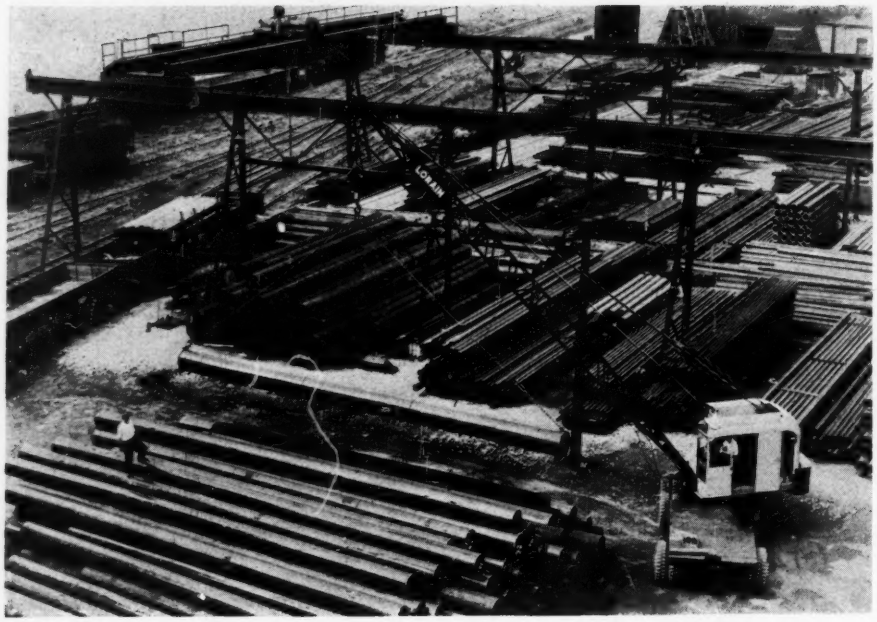
Watch this Electric Hoist cut handling costs



SEE the speedy Meteor in action and you'll agree that materials handling costs are down for the full count. This heavy duty electric hoist is an outstanding performer... a time and money saver. Helical gears, airplane type cooling, low headroom, thermal protection, only 110 volts at push button station... and speed... are but a few of the Meteor's notable features. Bulletin 142 will tell you about all of them. Better still, the Meteor itself will bring you all of them.

Capacities from ½ ton and up. Lifting speeds from 18 to 60 feet per minute.

CHISHOLM-MOORE
HOIST CORPORATION
(Affiliated with Columbus McKinnon Chain Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles



MOBILITY. Self-propelled crane solves many yard problems with its ability to reach all storage and receiving-shipping areas.

YARD AND BRIDGE CRANES, TRANSFER CARS

Mobile HANDLING FOR PIPE

Here is how one fabricator teams up self-propelled yard cranes with traveling bridge cranes. The mobility factor has brought these outstanding advantages:

1. **Receiving operations are performed anywhere in the extensive yard.**
2. **Unloading of mixed loads is done in minimum time.**
3. **Storage practices are aided because all locations are instantly accessible to the mobile crane, and long sections are no problem.**
4. **Shipping is speeded because all rail facilities are utilized.**
5. **Lifting capacities of outdoor as well as indoor bridge cranes are augmented by the self-propelled unit.**

HANDLING of pipe sections in hundreds of varieties, weights and lengths in the storage yard of Pittsburgh Piping and Equipment Company, Pittsburgh, has been reduced to a system which is as simple as it is effective.

The mobility provided by a self-propelled crane is extremely important because of the layout of the plant and storage yard. The layout includes a three-bay fabricating building at the north end of the property with a 200′ x 1000′ yard immediately adjacent to it. The property is bounded on the east and west sides by railroads.

A crane runway extends across the yard between railroad sidings. This five-ton capacity crane with an 80-foot span serves the open-rack storage area. Here, stocks of all commonly used types are stored for convenient movement to the nearby plant. The open racking method avoids having to go into the far ends of the extensive yard when a particular kind of dimension of pipe is needed. A standard gauge tram track runs from this area into the plant. The stock is loaded on eight-foot transfer trucks, which are unloaded by bridge crane in the plant, where it is fabricated into equipment for power plants, food, chemical and other processing industries.

The bridge crane performs various tasks. 1. It unloads pipe sent by customers, which usually goes directly into the plant for use on work in process. 2. It unloads certain sizes of pipe which are stored outside for a shorter or longer period. This includes pipe which

is given anti-rust treatment. 3. As already indicated, the crane accumulates loads under the span, from which shipments are placed on outbound cars. This central accumulation area is thus useful in speeding shipments.

Fast Operation in Large Yard

In previous years, when piping was limited to a few varieties and prompt deliveries could be obtained, the storage yard operations were maintained within a limited area. Recent engineering requirements have brought into popular use specialized types of pipe, and thus hundreds of additional varieties must be carried in stock.

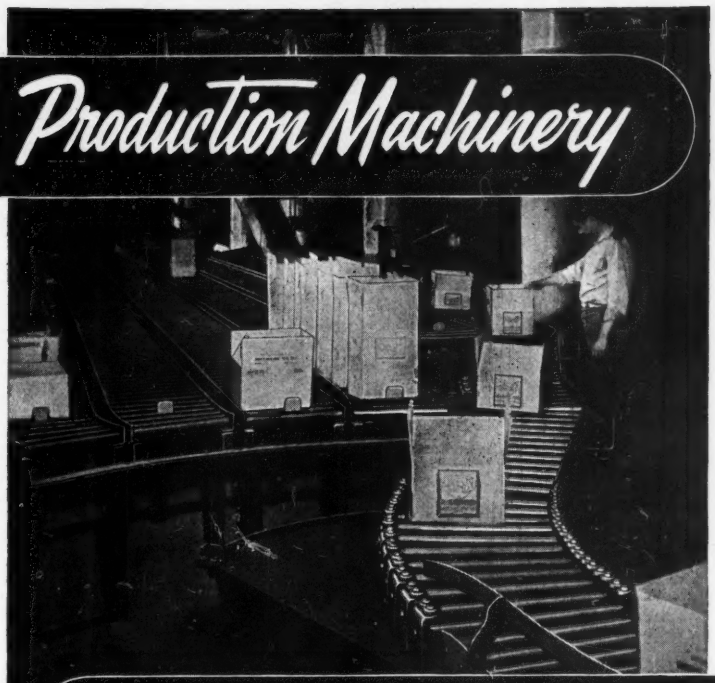
Greater stocks, in turn, have meant a larger storage yard, and this has called for handling equipment with ready access to stockpiles spread over a wide area and able to pick orders rapidly. This requirement was met with the addition of a pneumatic tire mounted self-propelled crane within recent months. This unit has a 45-foot boom.

Pipe lengths handled are up to 60 feet long and weigh up to five tons each. An advantage of the long boom is that it can carry the 60-foot sections at a 45-degree angle of the boom, thus avoiding contact of the load and power unit. A smaller self-propelled unit, with a fixed boom of two-ton capacity, is used for such lighter jobs as transferring and stacking crop ends.

With its unlimited operational range, the heavy-duty mobile crane has made possible increased utilization of the facilities involving unloading, order picking, storage, transfer and shipping operations. For example, the entire length of the spur tracks on both sides of the yard can be used for receiving or shipping, whereas formerly this could only be done under the fixed bridge crane.

Incoming cars can be spotted along the siding at convenient points near the bunkers in which

Production Machinery



not just auxiliary equipment

A Logan patented alligator switch receives cartons (of a famous confection) from any one of a number of storage lines and forwards them over a single line of conveyor to carton sealing machine. Cartons of a certain size accumulate on each storage line and when a line is full, the sealing machine is "adjusted" to handle that size. This speeds handling, permits efficient use of sealing machine.

MORE PRODUCTION! The world needs it. It *can* be accomplished, and with a definite decrease in manufacturing costs!

Logan Conveyors have ***multiplied volume*** in thousands of industrial plants. Well-planned conveying equipment keeps machines and processes going at capacity by delivering material to work stations on time, at convenient working heights, and by keeping a supply of material available at operators' elbows at all times.

In this way production tempo moves up all along the line. Just one of the reasons why Logan Conveyors are rightfully regarded as "production machinery."

It's more than likely that your plant, too, can use Logan material handling equipment to advantage in stepping up output, and in effecting economies in time, effort and floor space wherever used.

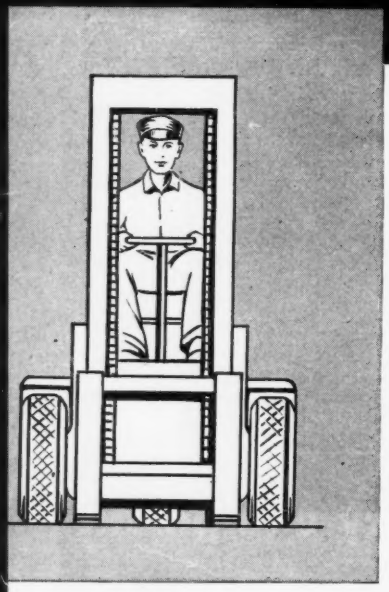
SINCE Logan 1876

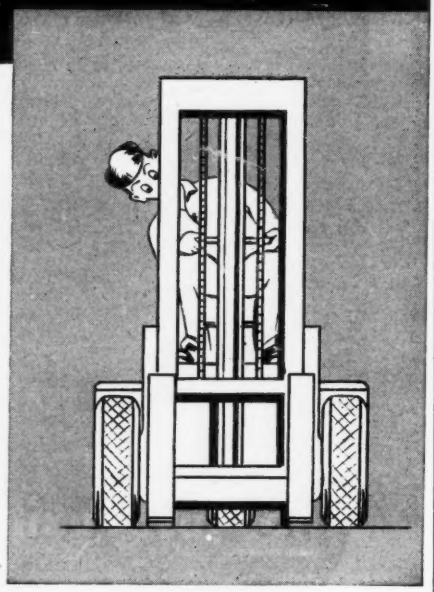
Logan Conveyors

LOGAN CO., INC., 558 CABEL ST. LOUISVILLE, KY.

BETTER VISIBILITY by 78%

New ROSS Series 5 LIFT TRUCK





Exclusive Tower design does away with this!

New

HANDLING EFFICIENCY *that* Cuts Costs!

NOW — faster handling with a minimum of loss from accidents and breakage. Neater, safer stacking and unstacking. Faster loading and unloading of cars and trucks. Smoother materials-flow indoors and out, lower handling costs, fewer delays to production . . . Get *all* the facts about this revolutionary lift truck — ROSS Series 5, 5000-pound capacity, pneumatic tires, gasoline power.

Rely On ROSS

THE ROSS CARRIER COMPANY

280 MILLER STREET, BENTON HARBOR, MICHIGAN, U. S. A.

Direct Factory Branches and Distributors throughout the World

the pipe is to be stored. Lifts being unloaded from the cars can be transferred to the various stockpiles with the shortest possible travel distance of the mobile unit. Frequently, too, the long boom permits the direct transfer of lifts from car to stockpile without any travel.

Due to the shortage in railroad cars, more mixed loads are arriving. This has given added emphasis to the importance of the mobility factor in the yard operation. The mobile crane is a handy tool in this operation as well. The long boom can transfer many diameters directly to the storage bunkers within its range. It sets down diameters going to distant racks along the track. These are carried in large lifts, or frequently in a single load by use of chain slings. Thus crane travel is reduced in this way as well.

Order picking is facilitated by roadways parelleling the rail spurs. The mobile crane and a highway truck can travel through the storage area together. Stock is selected and immediately placed on the delivery vehicle. The roadway, incidentally, has been laid out in a loop, making it possible to keep yard traffic moving in a progressive direction. This avoids the usual time losses encountered when trucks have to maneuver and reverse their direction in leaving the area. Since this order filling operation applies to material needed in the plant, production needs are served in minimum time.

The self-propelled crane is also used for other operations. One of the most frequent of these is teaming up with the bridge cranes in the yard and in the plant. For example, packaged power plants assembled in the plant for export shipment frequently exceed the capacity of the crane serving the shipping bay. The self-propelled crane is moved into the plant and is synchronized with the bridge crane in lifting the heavy loads onto the outbound flat cars. The mobile crane is also teamed up with the fixed yard crane in han-

dling lifts, either in loading or unloading, that exceed the latter's capacity.

A word about the storage practice used at Pittsburgh Piping and Equipment Co. In addition to the open-rack system under the span of the bridge crane, the bunker method is employed throughout the extensive yard. Each variety and size of pipe is assigned to an individual rack, facilitating classification, inventory and order picking. The vertical members of the conventional bunkers are uniform in height, but the width varies according to the size or amount of stock maintained. The supporting horizontal members are off the ground, thus keeping the stock clean. Each bunker is self-supporting. A particular size of pipe can be completely removed from its rack without endangering the stability of adjacent stock. The long boom of the crane provides a reach over several bunkers, which is found handy either in loading or unloading the bunkers.

Another feature worth mentioning is that the company has made special provisions to insure easy rolling of flanged-wheel transfer cars during winter months. Accumulations of snow and ice along the tram track, which formerly interfered with easy rolling of the heavily loaded trucks, are prevented from forming by steam lines installed in the pavement covering the rail bed. Compressed air lines, also in the bed, provide a means for blowing snow, dirt and loose rust from the pipe before it enters the plant.

The plant-wide advantages, given at the beginning of this article, stand out clearly, and all operations benefit from the mobility of the new method.

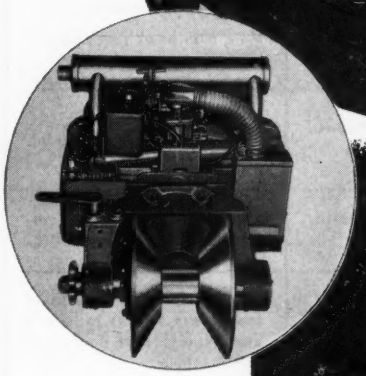
The FLOW Directory of Material Handling Equipment, Machinery and Accessories should be on every shop desk. Order your copy today!

FAST, LOW-COST Material Handling of 2000-lb. loads with the New Improved Chore Boy model FH

BUDA Chore Boy Model B . . . ½ ton capacity, 3 wheels. Also available with dual rear wheels, 1 ton capacity. (Model HB)

BUDA Chore Boy Model FF . . . 1 ton capacity, heavier throughout, 60% more loading space, dual rear wheels.

BUDA Chore Boy TRACTOR Model TR, for trailer hauling, same basic design—85% of parts interchangeable with other Chore Boy Models.



. . . featuring a powerful air-cooled 2-cylinder engine

This rugged addition to the famous BUDA Chore Boy material handling fleet is powered with a 10 H.P. air-cooled Onan 2-cylinder opposed-piston engine . . . providing the kind of dependable, low-cost power and speed you need for fast, efficient material handling. In addition, the Model FH brings you a larger platform area (20.1 sq. ft.) for more pay load . . . plus many other Chore Boy advantages, including short (7 ft.) turning radius—automatic safety brake—heavier, welded steel frame . . . instant reverse . . . and other features that pay off in handling all kinds of loads up to 2000 lbs. *Write for literature today.*

BUDA "Thrifty Lift" FORK TRUCK completes the famous Chore Boy line. 2000 lb. capacity . . . simple, sturdy design, construction throughout.

BUDA Lifting Jacks. Wide range of sizes, in both hydraulic and mechanical models, capacities from 3 to 75 tons.

BUDA

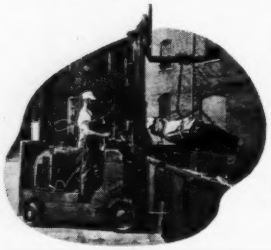
15400 Commercial Avenue
HARVEY *(Chicago Suburb)* ILLINOIS

This BAKER TRUCK
Box Score Indicates a Winner!

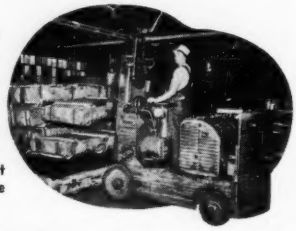
CUSTOMER: Appliance Division, The Cavalier Corp., Chattanooga, Tennessee.

PRODUCTS: Coca-Cola cooler-dispenser, Quaker Oil space heater.

TRUCKS: 6 Baker Fork Trucks—4 2000-lb. and 2 6000-lb. capacity.

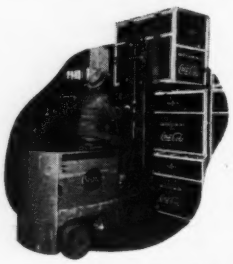


Baker 6000-lb. Fork Truck unloading skidded 6-ton packages of sheet steel from gondola cars with chain sling.

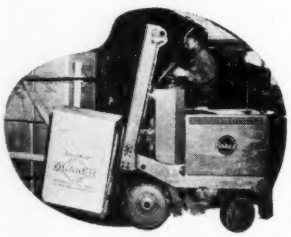


Same truck tiering sheet steel packages in storage department.

OPERATION	TRUCKS USED	RESULTS
Unloading steel sheets in 3-ton skidded packages from gondola cars (50 tons per car). Transporting to storage and tiering.	Baker 6000-lb. Fork Trucks	48 man hours cut to 4. Formerly took 6 men 8 hours for unloading alone. Now 2 men safely unload *and store* a carload in 2 hours.
Handling steel sheets from stores into production line.	Baker 6000-lb. Fork Trucks	More man hours saved. Aisles kept clear.
Handling and storing dies for stamping and blanking departments.	Baker 6000-lb. Fork Trucks	Time and storage space saved.
Moving finished products in cases to storage.	Baker 2000-lb. Fork Trucks	Operation speeded 50%. Warehouse capacity increased 50%.
Moving finished products from storage into boxcars.	Baker 2000-lb. Fork Trucks	16 man hours cut to 1. Formerly took 4 men 4 hours to load a car. Now 1 man does it in about 1 hour.



Baker 2000-lb. Fork Truck tiering cases of finished product in warehouse.



Baker 2000-lb. Fork Truck loading cases into boxcars.

The Baker Material Handling Engineer is at your service to help you improve your material handling box score.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*

2185 West 25th Street • Cleveland, Ohio

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

SAVED: 30 PER CENT . . .

(Continued from page 22)

area, a reserve stock of volume items was located where pallets were to be tiered three high and up to 10 in depth. The order assembly area is supplied from the reserve stock area and also volume orders are filled by lift truck directly from here. Such a method, although it did involve an extra handling of material (from reserve stock to the assembly area, requiring approximately three-fourths of a lift truck operator's time), concentrated the man power in one small area. This made supervision problems easier, cut man travel by about 75% in order filling, made possible economical use of floor space. The items in the assembly area were the only ones which required a permanent space location. The balance of the area (reserve stock) could be kept filled with the actual materials on hand, thus not requiring vacant spaces for out-of-stock items.

Pallet sizes were then determined by taking into consideration: (a) Dimensions of the packages to be palletized. (b) Standard fork truck capacities, dimensions and turning radii. (c) Weight of materials handled in order to avoid loads beyond capacities of trucks with minimum turning radii. (d) Most practical unit load determined by an order analysis.

The number of pallets was determined by an inventory analysis. This phase of the subject is covered in the second and concluding part of this report, which will appear next month.

The number of fork trucks and batteries as well as battery capacities were estimated by applying the formulas and estimating data supplied by the Industrial Truck Statistical Association.

(The concluding part in next month's issue will feature comparative material flow charts of the old and the new methods.—Ed.)

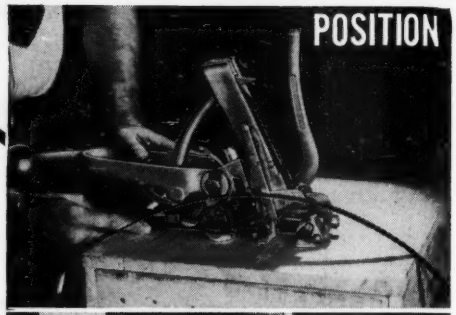
FLOW'S SECOND $1500 COST ANALYSIS CONTEST IS NOW OPEN. EIGHT PRIZES ARE OFFERED, AS FOLLOWS:

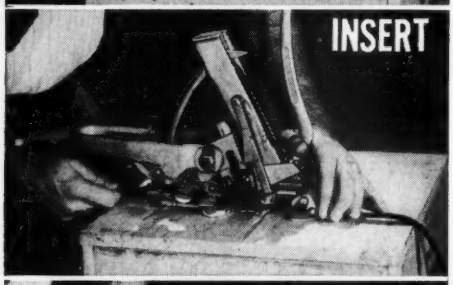
- FIRST PRIZE, $500; SECOND PRIZE, $300; THIRD PRIZE, $200; AND FIVE PRIZES OF $100 EACH.
- ENTRIES MAY COVER AN ENTIRE PLANT, A DEPARTMENT SUCH AS RECEIVING, PROCESSING, STORAGE, SHIPPING, OR OTHER IN-PLANT AND YARD OPERATIONS.
- THE PAPERS SUBMITTED MUST COVER ACTUAL OPERATIONS, SHOWING HOW COST REDUCTIONS WERE EFFECTED THROUGH APPLICATION OF MODERN HANDLING EQUIPMENT, BETTER LAYOUT, ETC. THE CONTEST CLOSES NOVEMBER 15, 1948.
- THE RULES ARE SIMPLE. GET AN EARLY START. YOUR PAPER MAY BE A WINNER!
- FOR ENTRY BLANKS AND COMPLETE DETAILS, WRITE TO: FLOW, 1240 ONTARIO STREET, CLEVELAND 13, OHIO.

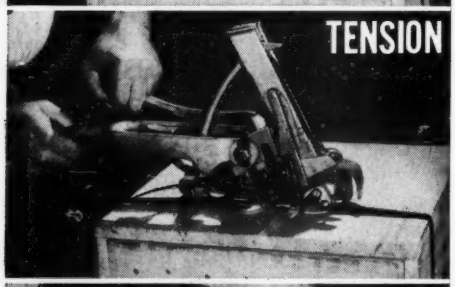
4 STEPS 5 SECONDS

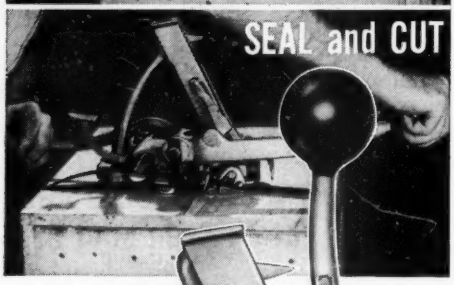
with the Improved

STANLEY ACE STRAPPING TOOL



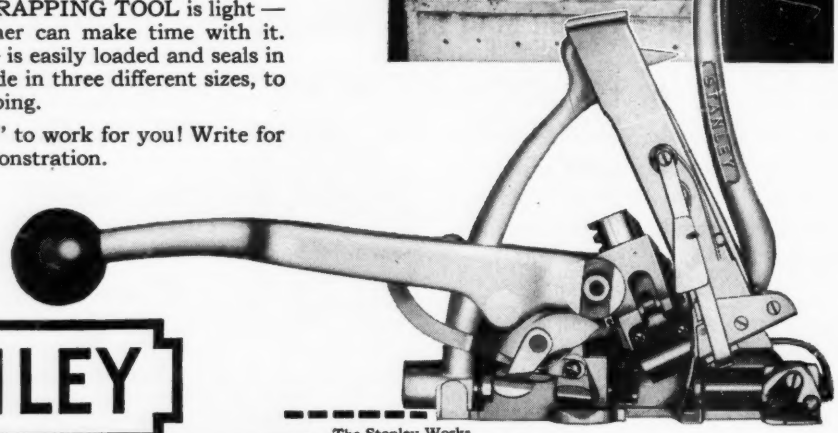






Here's how to put strapping on a production basis. This improved STANLEY ACE STRAPPING TOOL is light — fast — simple — even a beginner can make time with it. Magazine holds 75–100 seals — is easily loaded and seals in any position. The "Ace" is made in three different sizes, to handle 3/8", 1/2" and 5/8" strapping.

Decide now to put the "Ace" to work for you! Write for full information or ask for demonstration.



STANLEY

Reg. U.S. Pat. Off.

HARDWARE · HAND TOOLS · ELECTRIC TOOLS

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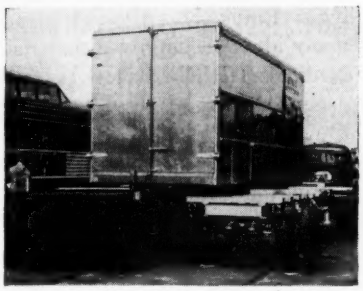
The Stanley Works
Steel Strapping Division
203 Lake Street, New Britain, Conn.

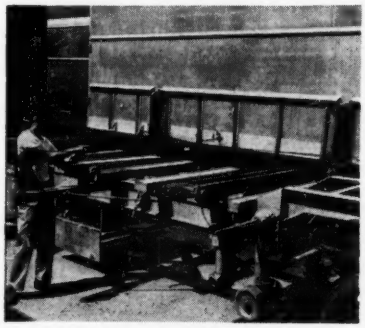
Gentlemen: Please send me free folder on the Improved ACE Strapping Tool.

Name.....
Title.....
Company.....
Address.....
City..... State.....

TWO "TRAILERS" MAKE A "BOX CAR"

Going to work for the Illinois Central Railroad on the Chicago-Memphis run are 12 of the new aluminum "Trailerail" containers for package shipments. These units, recently designed and developed by Reynolds Metals Company, are transported between shipper's loading docks and freight yards on special trailer frames and are shifted mechanically to standard type flat cars by means of built-in hydraulic lifts and a winch-and-cable arrangement. At destination, they are shifted back onto trailers and delivered to the consignee's door—efficient, compact, economical for handling shipments up to 20,000 pounds. With such self-contained units, much costly handling—unloading and reloading—is eliminated and time in transit is reduced. A greater net revenue for the carrier is expected as a result.





The Reynolds Trailerail is essentially a detachable trailer body 20 feet long, eight feet wide and eight feet high, made of strong, light aluminum. A manually operated hydraulic system built into each container and a power operated hydraulic system built into each trailer frame enable the shift to and from flat cars to be made quickly. Two Trailerails, each of 1,000 cubic feet capacity, can be carried on one flat car. This effects an operation similar to handling one box car.

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ON THE PALLET

NEWS · VIEWS · TRENDS

WHAT IS said to be the largest contract for hardwood pallets ever placed in peacetime in the nation was awarded National Pallet Corp., Pittsburgh, by the Army's Transportation Corps for shipment abroad. Approximately 24,000 pallets were purchased, which will utilize more than three million feet of lumber. The order would make up a train of 150 cars. The National Pallet Corp., according to President Harry I. Miller, has 15 mills in 11 states. The Army order will be filled from plants near Little Rock, Ark. Shipments abroad will be from Brooklyn.

THE YALE & TOWNE MANUFACTURING CO. reported in its 79th annual statement to stockholders and employees that its sales for its domestic and foreign divisions in 1947 exceeded those in 1946 by $22,165,283. Calvert Carey, president, stated that Yale & Towne's eight manufacturing plants in the United States, Canada and England shipped to customers $62,161,471 worth of locks, builders' hardware, hoists, industrial trucks, scales, and electric appliances during 1947. The 1947 sales volume was 12 percent higher than the largest sales record for any previous year in the company's history. During 1947 the company earned $5.84 per share, which is $3.72 more than in 1946.

ISLAND EQUIPMENT CORP., New York City, has negotiated for new and larger quarters in which the general offices and factories will be consolidated under one roof. The new plant is modern structure formerly occupied by Brewster-Rolls Royce organization at 27-01 Bridge Plaza North, Long Island City 1, N. Y. It is expected that alterations will be completed by May 1. The larger quarters were designed to accommodate the company's expanding conveyor manufacturing business.

TECHNICAL papers presented at the Second National Material Handling Exposition in a single volume, "Some Basic Techniques in Material Handling", has been announced by Clapp & Poliak, Inc., exposition managers. The book, believed to be the first report of its kind, contains 84 pages, 19 papers, 15 pictures, 11 diagrams and four charts. It may be obtained for $1 from Clapp & Poliak, 350 Fifth Ave., New York 1, N. Y.

EMPLOYEES of the Westinghouse Electric Corporation during 1947 figured out 7,755 new and better ways to do their work. T. O. Armstrong, director of plant labor relations, said a total of 20,743 ideas were sent in through the Westinghouse suggestion system last year. Of these, 7,755 were adopted, bringing a total of more than $105,000 in awards to some 5,000 employees. Employee suggestion plans are also developing many ideas on improved material handling which are resulting in less effort, better working conditions, less product damage, and greatly improved production methods.

ONE OF the most important railroad motive power problems being solved today is the matter of spare and replacement parts for the diesel-electric locomotives. These are said to be produced in record quantities for leading U. S. railroads at the American Locomotive Company plant in Schenectady. All of the working parts in each type of new diesel-electrics are interchangeable. This results in savings both in time and money when spart parts are needed. Diesel-electrics are said to spend less than four per cent of the time in the shops, and hence the importance of the ready availability of renewal parts.

THE NATIONAL SCREW & MFG. CO. has extended its activities with the recent announcement of the acquisition of The Hodell Chain Company. National Screw is one of the country's largest manufacturers of bolts, nuts, screws and other industrial fasteners, while Hodell makes a complete line of both welded and weldless chain. Fred G. Hodell, President of the Hodell Chain Company, will remain with the organization and be in charge of the Hodell Chain Division operations. This is the second time in recent months that National Screw has expanded its line of products. On the first of this year the company purchased The Chester Hoist Co. of Lisbon, Ohio, manufacturers of chain hoists and trolleys, which is being operated as the Chester Hoist Division.

ROBERT S. HAMMOND, vice president of Whiting Corporation, Chicago District Sales Office, announces that, effective May 1, 1948, the new address will be, First National Bank Building, 33 South Clark Street, Chicago 3, Illinois.

How to Save five ways on Packaging

Read how Acme Steelstrap enabled maker of aluminum garage doors to save materials, labor, freight costs, inventory, and damage claims.

Tubular Aircraft Products Company, Los Angeles, make these popular aluminum garage doors.

Management considered their previous method of packaging too slow and expensive.

After consulting with an Acme Shipping Specialist, the company adapted Acme methods to bring about this 5-way saving:

1. **Acme Steelstrapped telescope corrugated containers bring a saving in *materials*.**
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4. **Same precut corrugated board used in carton will package one to four-door shipments for reduction in package materials *inventory*.**
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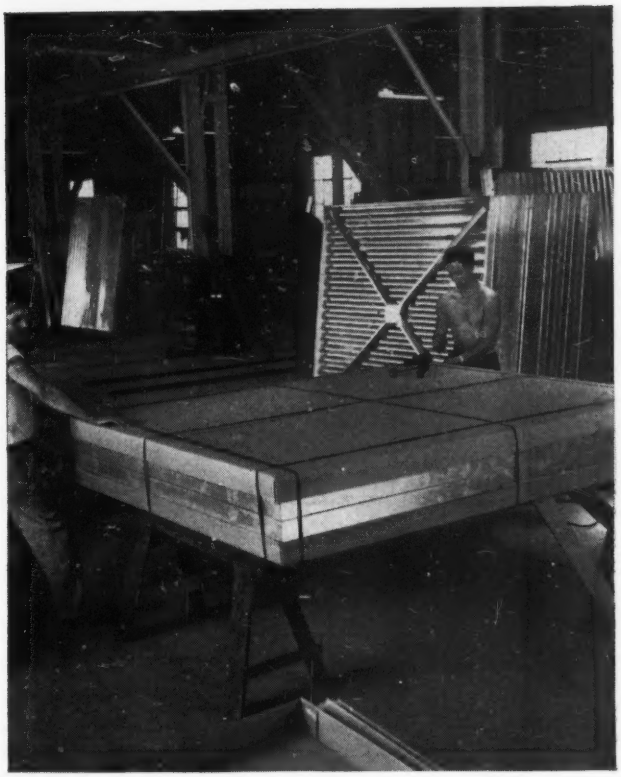

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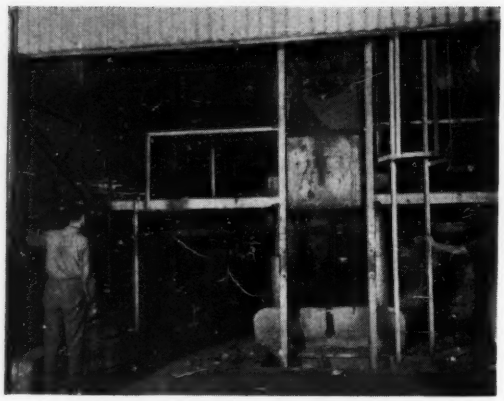
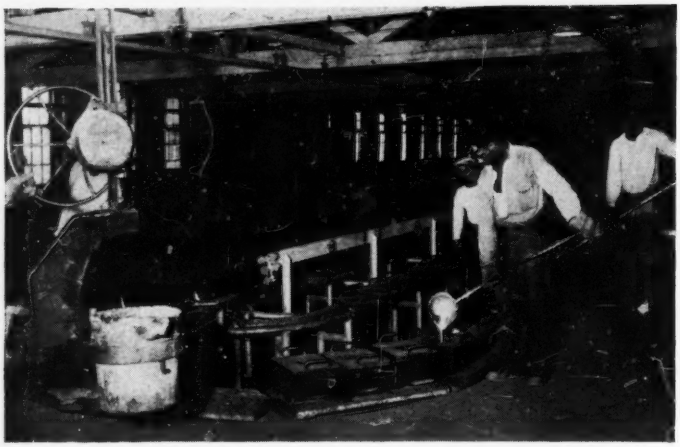


CHARGING BUCKET ON WAY. Mechanical charging makes safer, easy operation. Control is shown at left.

At Sargent's mechanized foundry .

ALL OPERATORS MEET T

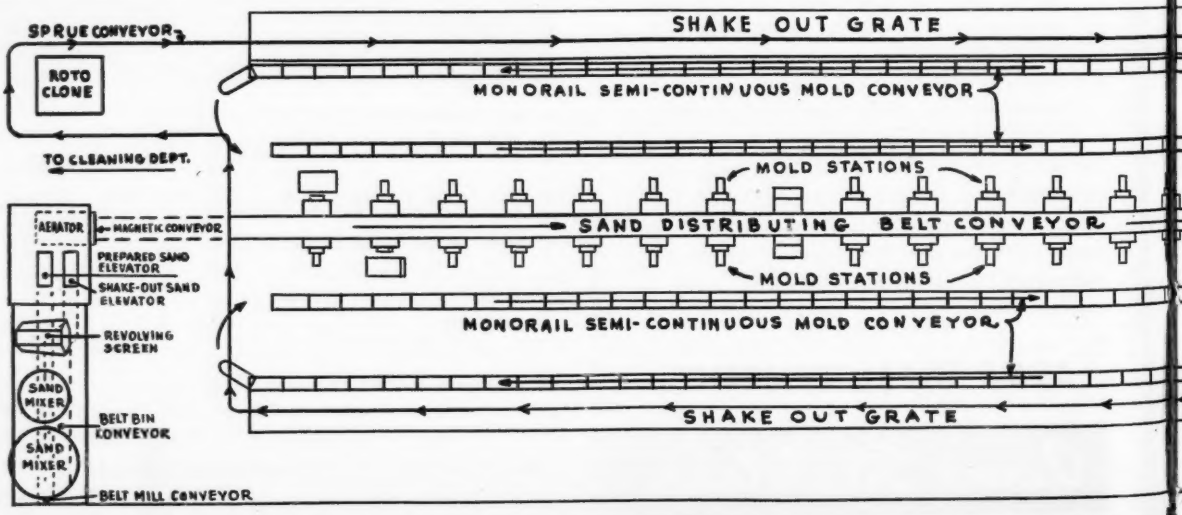
SKIP HOISTS, MONORAIL EQUIPMENT, MOLD POURING TRAINS, FORK TRUCKS, CHAIN BELT AND GRAVITY ROLLER CONVEYORS



MOLD POURING TRAIN, with weight benches in pit. Note monorail track, with bull ladle. It supplies small ladles.

Fifty per cent more castings with the same floor space and with no increase in manhours—that's the significant point about the new gray iron foundry of Sargent & Company, New Haven, Conn., one of the big four in the hardware industry.

FLOW SHEET shows all equipment mentioned in article



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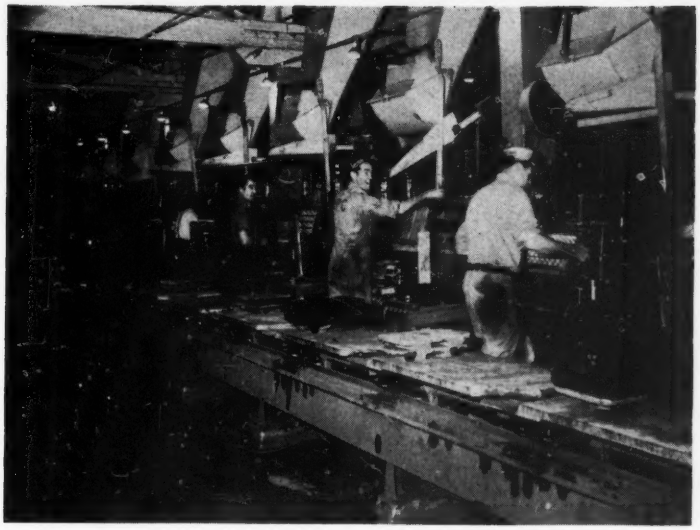


FIVE-MINUTE CYCLE. Mold makers, too, keep on move in order to load flat cars on schedule. Train is in foreground.

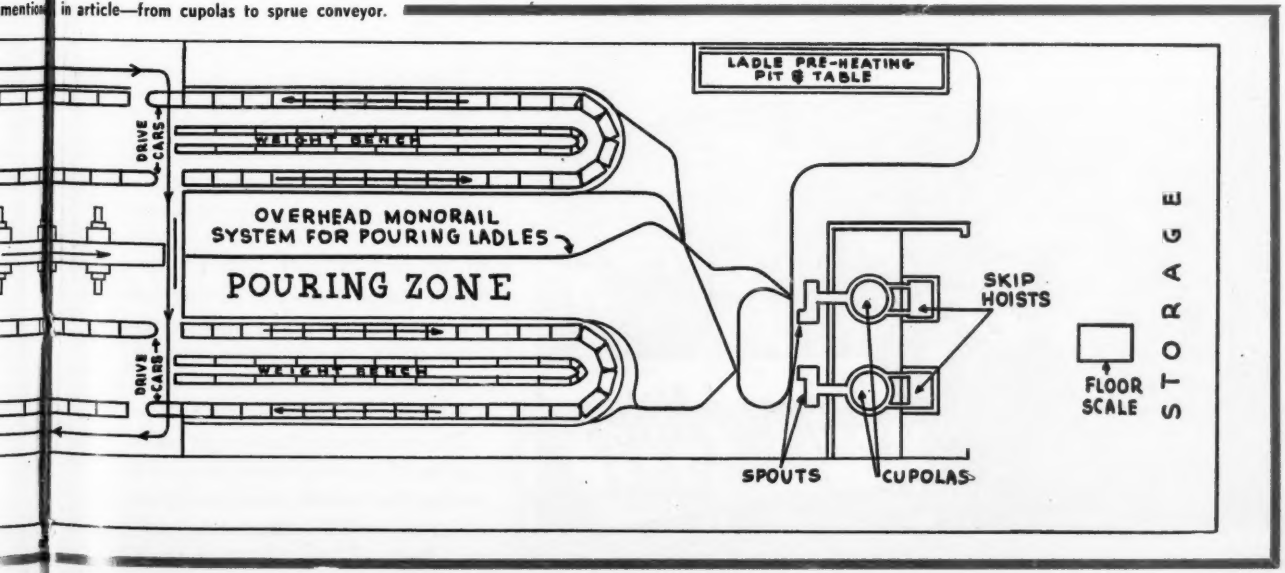
THE FOUNDRY produces component parts for 33 per cent of the large volume of Sargent hardware items which are shipped all over the world. (Items produced in the company's press, screw machine and brass foundry departments account for the remaining 67 per cent of items.) Other benefits rank importantly along with the appreciable production increase of castings, among them: easier jobs, pleasanter working conditions, better housekeeping and improved plant safety.

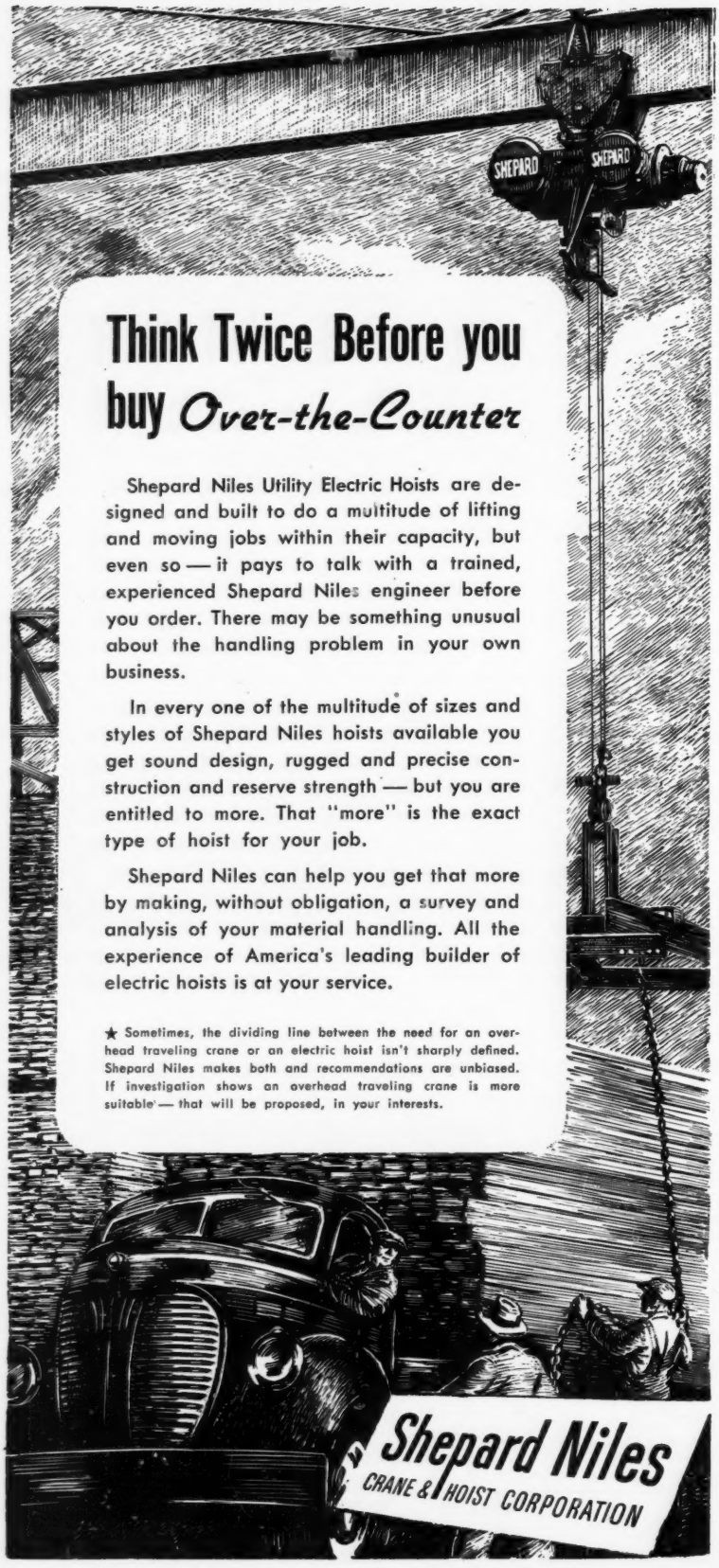
The company's mechanized foundry started operating in June, 1945. The material flow in the rectangular 100'x700' room is north to south, as shown in the accompanying flow diagram, with the cupolas located at the extreme north end. Every part of the operation is on wheels —mold making, pouring, shake-out, inspection, as well as such auxiliary functions as sand replenishing, transfer of cooled castings and sprues.

Planned Raw Material Storage

Storage for raw materials—iron, scrap, coke, flux—is provided within the building to the north of the two cupolas. Each cupola is operated on alternate days for maintenance and repair purposes. As can be seen from the diagram on these pages, the raw materials advance in a straight line to the floor scale, then to the skip hoists. The latter eliminate both the hard job and exposure to heat and furnace gases that would be entailed in hand charging. The charging operation is on a continuous basis dur-

mention... in article—from cupolas to sprue conveyor.

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Shepard Niles Utility Electric Hoists are designed and built to do a multitude of lifting and moving jobs within their capacity, but even so — it pays to talk with a trained, experienced Shepard Niles engineer before you order. There may be something unusual about the handling problem in your own business.
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ing the eight-hour shift, and each cupola has a capacity for producing three tons of iron per hour in a continuous stream.

Company engineers point out that inside storage of raw materials was especially planned in order to eliminate the unpleasant task of hauling supplies from outside stockpiles, especially during rainy or cold weather. A supply for 10 days of operation can be stored within the plant.

Safe and speedy handling of the molten metal is provided with an overhead track system for the bull ladles. The combined length of the overhead trackage is 470 feet, with eight pull switches. The several lines extending from the spouts to the pouring floor are shown in the flow sheet. Each of the two pouring stations is served by a dual track that extends south from the central switching point. The bull ladles traveling on these tracks bring the metal conveniently to any mold on the mold pouring trains.

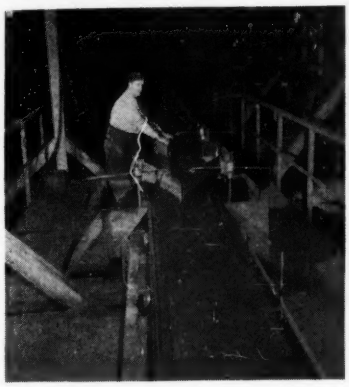
You will notice an additional longitudinal track extending from the central switching point to the center of the pouring floor, equidistant from the pouring stations to the east and west of the layout. This track is for bull ladles which carry a reserve supply of metal. Because of the central location of the reserve track, this supply can be readily drawn on by the pourers from either side of the layout.

Molds Travel, Pourers Pour

When molds are set out on the ground, a large part of the productive time of the pourers is necessarily consumed by walking, or running, between the rows of molds. In the new Sargent Foundry the molds keep traveling on the monorail molding conveyor trains, and the pourers are effectively engaged filling the molds with an absolute minimum of walking.

The entire operation—mold making, pouring, shake-out—is geared to the five-minute time cycle on which the mold-bearing trains operate. Each of the two oval track

systems shown in the flow sheet has a length of 340 lineal feet and accommodates three trains. Each



SAND DISTRIBUTION BELT supplies thirty molding stations. This one operator serves all.

train, 105 feet long and powered by a two h.p. drive car, consists of 30 trays or flat cars. Following are the steps of the mechanized mold-making-pouring-shake-out cycle.

Train A has just stopped alongside the 15 molding stations. Each mold maker is responsible for loading the two flat cars, or trays, across from his station. The width of the space is four feet, requiring a minimum of steps on the part of the operators. Meantime, the pouring and shake-out operations are going on simultaneously.

Train B has pulled into the pouring loop, the north end of the track, where the operators work on each side of the layout as a team. They are responsible for filling each of the molds just arrived from mold-making. The pouring may be done directly from bull ladles traveling on the monorail track (if the castings are large), or, which is more frequently the case, from hand ladles which receive the metal from the larger units.

The pouring floor is elevated to the level of the trays on the flat cars, with an oval pit in the center. In the later, the weight benches are located, and here operators place the weights on the molds.

While Train A is receiving the molds and Train B is being poured, Train C, the last of the three operating in each part of the dual layout, is at rest at the shake-out sta-

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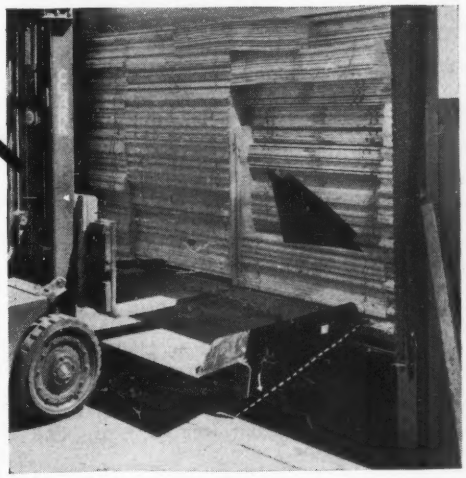

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**Statement of Nathan Bedford Forrest (1821-1877), great Confederate cavalry leader. Volunteered as private in 1861; made a major-general in 1863.*

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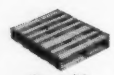

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tion, across from mold-making in the south section of the layout. Here the molds, just arrived from the pouring floor, are being dumped by an operator stationed on the inside of the track. He merely lifts one end of the molds and lets them slide onto the grating of the shake-out hopper which extends the full length of the train.

The five-minute cycle of the three trains on each track is controlled by means of an adjustable timing device and limit switches. Three quarters of a minute before the trains start moving, a whistle blows a warning signal to the mold making, the pouring, and the shake-out operators. There may be a final flurry of activity to "make the train". The five minutes completed, each of the three trains advances simultaneously to the next location.

Methods for Mechanical Handling

Refinements in operating methods were engineered in accordance with the new operation. For example, the standard one-inch openings of the grating in the shake-out hopper may be too large when certain types of small castings are produced. In that case, a small-meshed wire screen is laid over those parts of the grating where these particular castings will be dumped.

The ease of dumping the molds has already been mentioned, the operator merely lifting the board at one end and letting the unit slide into the shake-out hopper a few inches below the level of the trays on the cars.

Another method adopted in this connection is of special interest. The shake-out hopper on each side of the layout is 106 feet long. The entire length of these hoppers is divided into equal sections which are numbered. These numbers correspond to those of the molding stations—from one to 15. This means that two cars of each 30-car train stop regularly across from the same section of the hopper. For example, molds from No. 12 Molding Station will be dumped in the

(Turn to page 74)

PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

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Several problems are solved in this . . .

Orange Juice Canning Operation

PACKAGING MECHANICS SECTION

Modern cannery practices in handling raw materials, empty cans, processing, and in finished goods warehousing. Techniques of special interest are incorporated in this operation.

THE fruit canning plant's seasonal production and the perishability of the product emphasize the necessity for high-production equipment capable of processing and packaging peak loads in concentrated periods. In past years, seasonal production peaks were handled by calling in more help. More recently, the trend has been, due to continuing help scarcity, to supplement the available labor supply with more productive equipment and methods in order to increase unit production per man-hour and thus reduce unit cost.

This was the production practice adopted by progressive canners, among them Mann Bros. Canning Co., Lakeland, Fla., packers of citrus products and vegetables. This description covers the packaging of orange juice.

Easy Handling of Raw Material

The oranges are received in truck loads, the vehicles being equipped with hinged end gates. The trucks are weighed on a platform type scale before and after unloading. The fruit is usually brought in by independent buyers ("bird dogs"). The trucks are unloaded by backing them down a ramp sloping toward the dock. The latter has a built-in flight conveyor whose wooden flights, 31 inches wide, are spaced on 13-½-inch centers (see photo). The truck operator controls the discharge rate of the fruit by varying the opening of the end gate. By use of this gravity method, one man unloads 27,250 pounds of oranges in 15 minutes.

The flight conveyor runs parallel to the dock, then inclines 40 degrees to deliver the fruit to overhead storage bins. On the second floor, the product is discharged on a roller grading conveyor, where undesirable fruit is removed and thrown into a chute leading to the truck dock. The defective fruit is returned by gravity to the empty vehicle, the canner paying only for the usuable product.

The inspected oranges pass over a sizer which segregates three sizes and drops them on belt conveyors. The latter deliver the fruit to storage bins which hold the equivalent of 300 boxes of fruit each. The bins are equipped with internal baffles that perform the dual function of reducing the length of the fall as well as the weight on the lower layers. The bin bottoms are sloped 30 degrees for gravity unloading. Usually a two-day bank of fruit is stored. The material is discharged via gates to a belt conveyor that delivers to the scalding operation. Here the product is steam-sprayed to seal in the peel oil, preparatory to juicing. (The oily peel has a strong flavor.) A rotary brush washing machine performs the final washing.

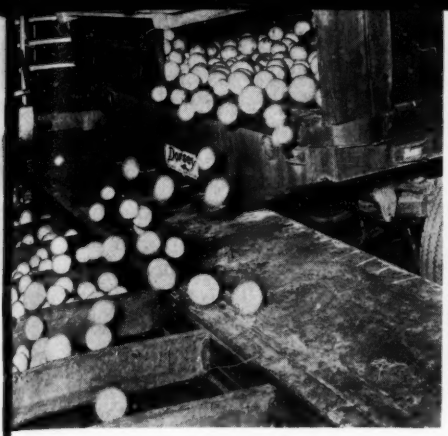
A flight conveyor delivers the material to the juicing machines, where it is resized and juiced automatically. After straining, blending and pasteurizing, the juice is ready for the fillers. The hulls or peels are ejected onto belts that deliver the material to storage hoppers. (It is sold to cattle feed manufacturers.)

Effective Conveying Methods Throughout

The orange juice is packed in two sizes of cans—the #2 or 18-ounce and the #3 or 46-ounce sizes. These are normally received in "bulk" carload lots with as many as 86,000 cans to the car. An operator using a pair of scissor-type unloading forks picks up 32 cans at a time (they are loaded with the open ends facing the car door). The two rows of 16 cans each are deposited on a gravity chute (extended into the car) which feeds the powered conveyors and elevators (see photos) that deliver to the filling machines.

For the #2 cans an 18-valve filler is used which is capable of filling 160 cans per minute, and for the #3 specials a 12-valve unit with a capacity for 90 cans per minute. Both machines have a bowl-type reservoir for the juice that is piped from the pasteurization unit. From the fillers the cans pass to the cappers where the lids are crimped on. For ease in handling, the caps are received in paper tubes in lots of 250 each, which are thus conveniently stacked into the magazines of the machines.

Pasteurization just before filling brings the temperature of the juice to 190 degrees F. This heat would make the application of the labels to the cans difficult, and hence the units are first cooled by spraying. The cooling conveyors (drag-chain type) are 60 feet long and during travel on these the heat is reduced to about 95 degrees. The #3 cans pass through single file, but the higher speed of the #2 cans requires them to be run in double rows. This is accomplished with a divider. A similar unit causes the two lines to converge into one line after cooling, as shown in one of the photos. This converging device has a cam wheel that is geared off the conveyor drive. It rotates slowly,



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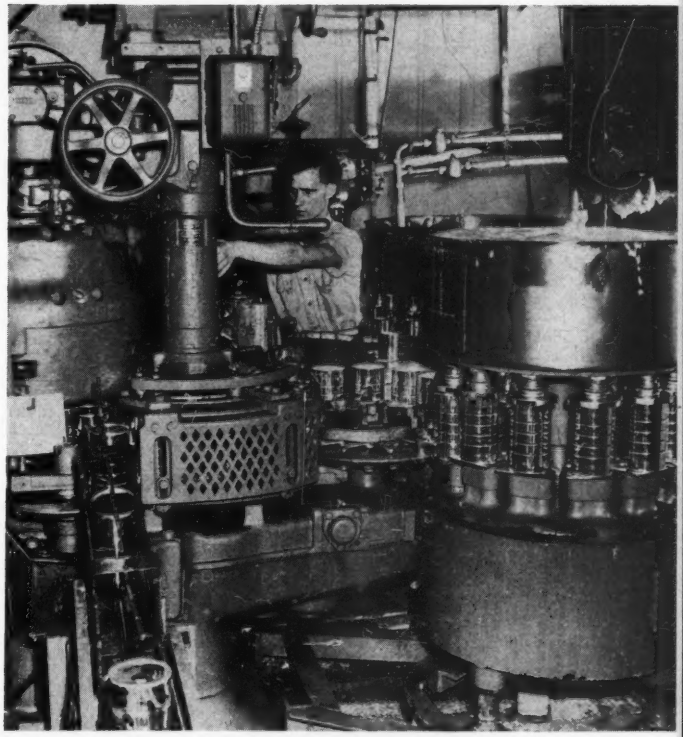


3

1 **FLIGHT CONVEYOR** on truck dock receives oranges from vehicle discharging load by gravity.

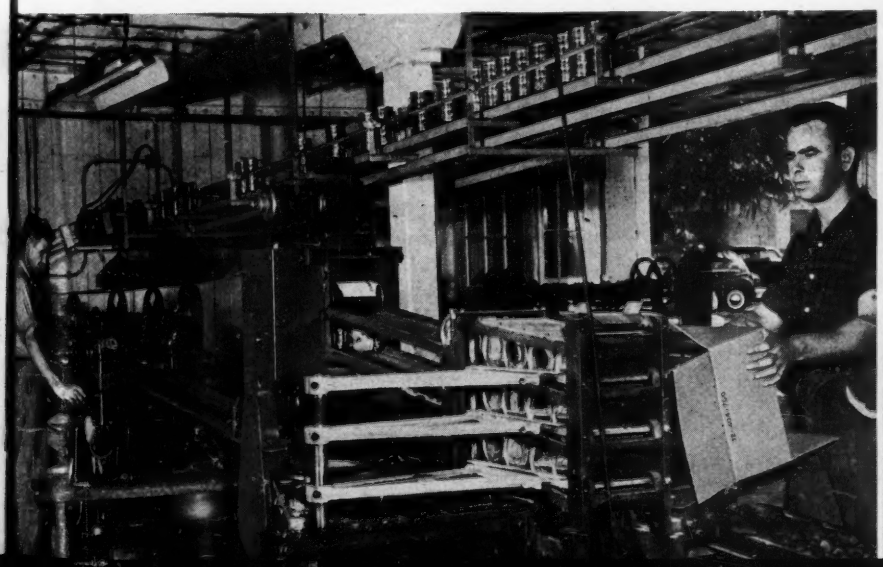
2 **GRAVITY CHUTES** deliver empty cans to elevator. Article describes 32-pronged fork used.

3 **NINETY #3 CANS** are being filled and capped per minute. Note can slide at right of photo.

4 **CONVERGING UNIT** consolidates two lines into one. Cam-shaped wheel releases the cans.

5 **SEMI-AUTOMATIC CASE LOADER** starts as operator pushes empty carton against the fixture.

5



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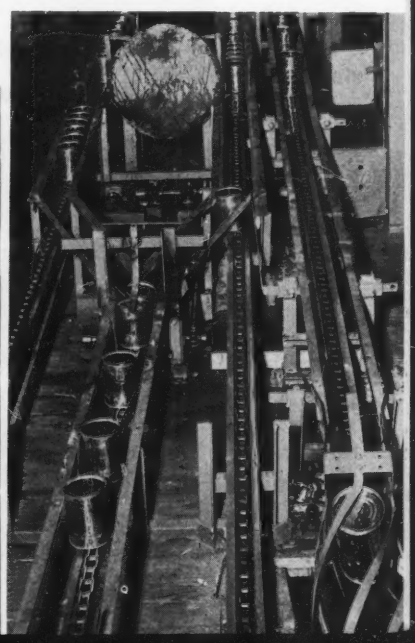


regrouping nine cans alternately from each chain into a single row.

A twist places the cans in a horizontal position for labeling, the next operation. A retarding device on the labeling machine spaces the full cans and eliminates jams. The released can rolls over a hot glue applicator, then picks up a label from the magazine beneath the "can roll." The label covers the can surface smoothly, except for the lap end. A second glue applicator spreads adhesive on the overlap to complete the seal. The units then pass through a short compression belt that secures the bond.

CASE SEALER AND COMPRESSION UNIT. Length of unit determines setting of glue.

Case Loading, Proper Glue Setting Time

Next in line is a short chute which delivers the labeled units to the semi-automatic case loader. This chute is hinged at the case loader end and automatically shuts it off until enough cans weigh it down and trip the switch to start it. The "feed" of the loader is an elevator, as shown, which raises the cans to the levels of the three chutes that feed the loading jig and ejects the cans at one stroke, causing them to roll into the three-level jig (four # 3 cans to a layer).

The operator places a knocked-down corrugated carton, partially set up, over the spout of the jig. The bottom edge of the carton comes in contact with a switch that starts the rams which advance the cans into the case. The loaded but unsealed case is disposed of by the operator on a section of gravity wheel conveyor. Thus the two bottom inside flaps are folded under and the two outside flaps are folded out for case sealing. A fully automatic top and bottom case sealer is next in line, which spaces the cases by means of a retarder. A pusher rod advances the case through the machine. To fold in the two inside top flaps, a swinging arm device descends to depress the flaps until they pass under a holding plate. Four flared guides then fold back the outside flaps for the pass over glue applicators. A second set of flared guides folds down the glued flaps, and the cases then enter the compression unit.

The latter is long enough to give a one-minute compression time if a

TAKE THE "HAND" out of HANDLING

Expensive sealing operations are done faster, more economically with the streamlined A-B-C Top and Bottom Case Sealer. A recent installation in one plant saved $4000 the first year. Cases are sealed directly from the production line at speeds up to 60 cases per minute. It's all automatic. No operators required. Top inner flaps are tucked as bottom outer flaps are opened without disturbing contents of case. Glue is applied both top and bottom and outer flaps folded in place simultaneously. Compression unit with individual spring rollers applies even pressure to complete the sealing job. Unit can seal top flaps only or bottom flaps only. A-B-C specializes in building packaging machinery exclusively. Let an A-B-C specialist help solve your packaging problems. Write A-B-C PACKAGING MACHINE CORP., Dept. F6, Quincy, Ill.

CHECK THESE A-B-C FEATURES

- Built in power permits finger tip control
- Simple, sturdy construction for minimum down time . . . low maintenance cost
- Adjustable to wide range of case sizes by pressing a button
- Glue applicator and compression unit supported at 4 points for even pressure
- All main drives ball bearing equipped—geared head motors

A-B-C PACKAGING MACHINE CORP.
MOBERLY, MISSOURI

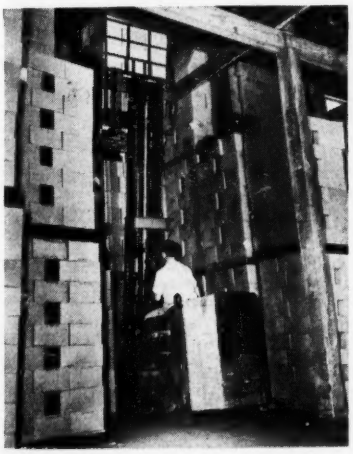
OTHER A-B-C PRODUCTS
Automatic Top Sealer • Automatic Side Sealer • Semi-Automatic Bottom Sealer • Hand Gluer • Glass Container Case Packer

steady stream of cases is being run. A special switch at the intake end allows the unit to run only when a case is ready to enter it. Thus, if the flow is sporadic the compression time increases.

A section of gravity wheel conveyor receives the sealed cases, which are then stenciled and loaded on 32" x 40" double-face pallets, usually nine layers of five cases each. The resultant load is 68 inches high over-all. While the production of citrus juice is restricted to about six months, its consumption is the year 'round. This brings out a very real storage problem.

Well Engineered Handling of Finished Products

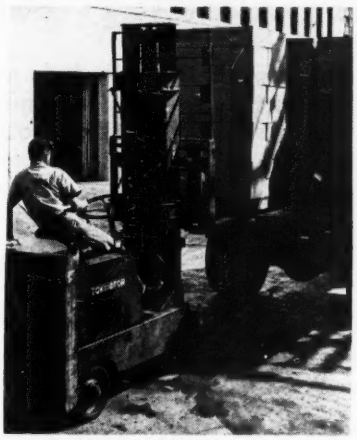
To solve it, fork trucks capable of stacking the 68-inch loads three high were provided (204 inches to the top of the tier). Another rea-



"THREE HIGH" results in stack 204" high. Article explains solution of warehousing job.

son for loading the pallets to this height is found in the construction of the main warehouse. The wooden cross struts are 12 feet high, but the ceiling has a 20-foot height. This means that some pallet loads can be stacked three high, those beneath or adjacent to the struts only two high. The 68-inch loading of pallets results in the fullest possible utilization of the cube under these conditions.

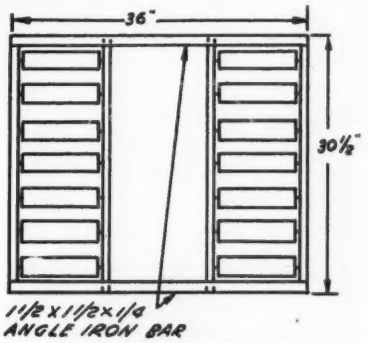
No motor truck dock is available at this or a second warehouse used by the company. To facilitate pallet handling to and from the highway vehicles serving the wareing, a dolly is placed at the rear of houses, roller type dollies were constructed. These units are of the same size as the pallets. For load-



SPECIAL ROLLER DOLLIES on truck bed advance pallet to front end. There's no dock.

the motor truck body. The loaded pallet is then spotted on the dolly. The fork truck pushes the load ahead, with the points of the fork placed against the rear of the dolly. Six pallet loads constitute a truck load. The first four are loaded on dollies and advanced to the front end as described, while the last two are set directly on the truck bed.

The unloading is done by attaching a rope to the dollies and pulling the pallet loads to the rear of the truck bed with the fork truck. The

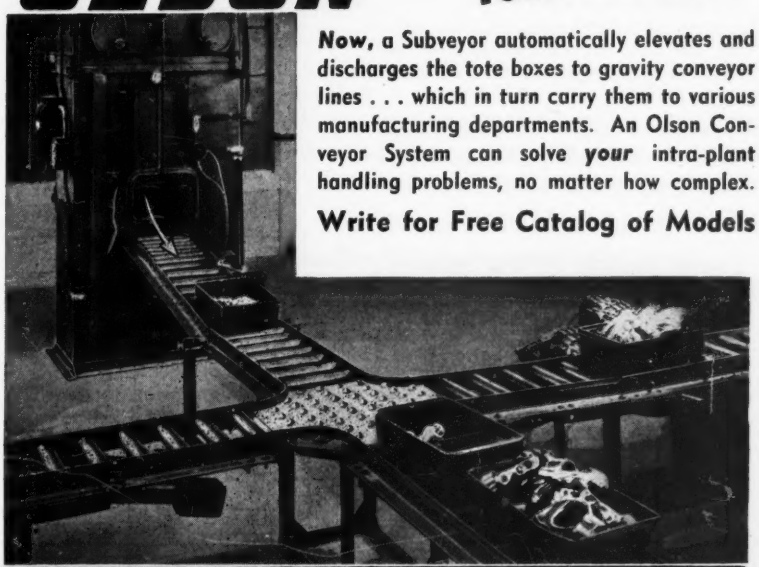


Detail drawing of special pallet dolly, left.

latter quickly picks off the pallets, leaving the dollies on the highway for return to the plant.

This was a back-breaking, time-consuming job...before the

OLSON CONVEYOR SYSTEM took over!



Now, a Subveyor automatically elevates and discharges the tote boxes to gravity conveyor lines . . . which in turn carry them to various manufacturing departments. An Olson Conveyor System can solve *your* intra-plant handling problems, no matter how complex.

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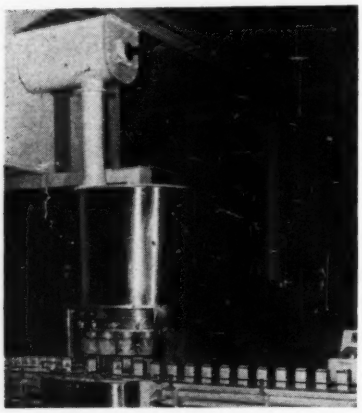
SAMUEL OLSON MFG. COMPANY, INC.
2426 Bloomingdale Rd. Chicago 47, Ill.

Upping Packaging Production To Meet Greater Market Demand

PACKAGING MECHANICS SECTION

Problems in packaging baby powder . . . ingenuity in raw material handling . . . balancing mixing operation with high-capacity filling equipment . . . and other factors designed for maximum packaging production.

IN THE past few years, increased emphasis on infant hygiene has resulted in sky-rocketing demands for products manufactured specifically for that market. Items such as baby powders, creams, oils and soaps, once produced on a limited basis, became mass production items. The low production and packaging facilities of former times were no longer adequate, and high-volume equipment became a necessity.



FILLING MACHINE is fed by screw conveyor, top. Full cans, right, are conveyed to the capper.

Planned Handling For Raw Materials

Johnson & Johnson of Chicago, manufacturers of surgical dressings and baby products, was one of the companies in this field to revamp its facilities to keep pace with the demand. Facilities and methods for mass production were adopted. While this article covers one of these items, baby powder, many of the methods described apply to other members of the Johnson & Johnson family of products.

Baby powder is usually packaged in cans of three different sizes. The cans are rectangular in shape and contain the following quantities: 10, 4⅛ and 1¾ ounces. Their overall sizes in inches are as follows: 2⅜ x 2⅜ x 5⅜; 1¾ x 1¾ x 4¼; 1⅜ x 1⅜ x 3¾.

These three sizes are run over the same equipment, a fact which brings out a production requirement—flexibility. The optimum run for each size has been determined as two weeks. This time factor has been kept as high as possible in order to minimize set-up time, since each change-over requires eight hours.

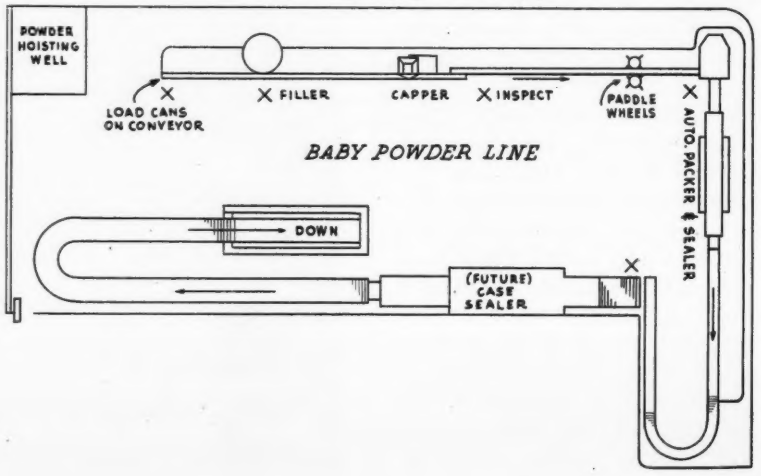
The raw material is received in bags which are delivered to the second-floor mixing room on pallets. As shown in one of the photos, an effective method is used for getting the pallet loads to the upper level. This method utilizes a high-stacking fork truck which elevates the loads through a trap door in the ceiling. After the components have been blended in a mixer, the finished powder is fed to the filling machine hopper by a screw conveyor.

Steps In Filling Operation

The first step in the filling operation is the removal of the empty cans from the cases in which they are received. They must be placed on a conveyor for transfer to the filling machine. Each case contains 400 cans without caps. To facilitate unloading, the cases are removed from the pallet and placed on an inclined table, which positions the units at a 30-degree angle. In this position the operator is able

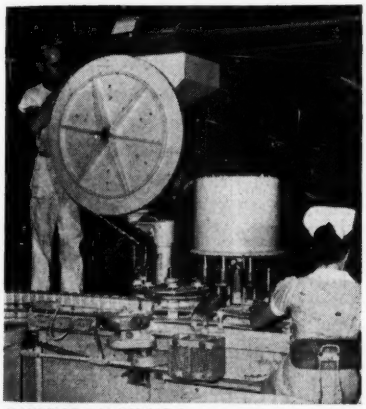
PRODUCTION TECHNIQUE. Operator feeds 10 empty cans to conveyor which delivers to the filler.

FLOW DIAGRAM of packaging line for baby powder.



to grasp an entire row of 10 cans and place them on the powered conveyor.

This is an important detail, since the same operator also has the duty of loading the caps into the capping machine hopper. It is doubtful if the operator could perform both



CAPPING MACHINE hopper is being loaded. Article explains method used for aligning square caps.

tasks without this production aid. At the present time the packaging equipment is operating below maximum because of inadequate mixing capacity. Whereas production now varies from 54 to 104 cans per minute, depending on the size, anticipated new mixing equipment will permit the filling of 180 cans per minute of all sizes.

The conveyor used for feeding the cans to the filling machine is of the table top type (frequently called "bottle conveyor"), which is generally used for bottles, jars,

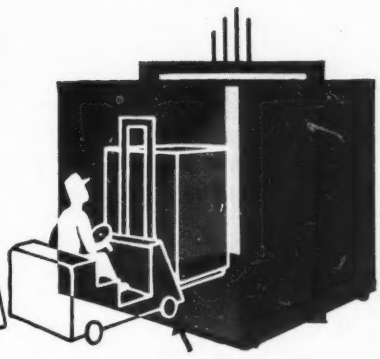
CASE LOADER RECEIVES EMPTY CARTON, which is loaded automatically by the machine in two posses.

cans, etc., which must be fed continuously into automatic packaging equipment.

Change your thinking

about FREIGHT ELEVATORS for POWER TRUCK LOADING

500 LB. HAND TRUCK



8,000 LB. POWER TRUCK

It is necessary to change your thinking about freight elevators when you change from hand truck to power truck loading.

The reason? *Additional severe forces caused by industrial power truck loading!*

As illustrated above, a hand truck weighs about 500 pounds. Its pay load is relatively light.

Power truck loading completely changes this picture. A power truck may weigh 8,000 pounds, or more, plus its proportionately heavier pay load. It travels fast, stops quickly. It delivers its freight with a heavy impact . . . loads heavily off-balance . . . greatly increases the static load.

Obviously, power truck traffic can be handled safely only in freight elevators that have been specifically designed to take power truck 'punishment'.

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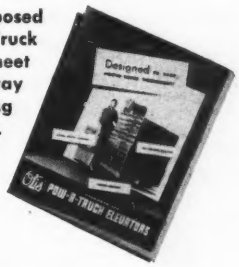

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STANDARDIZED

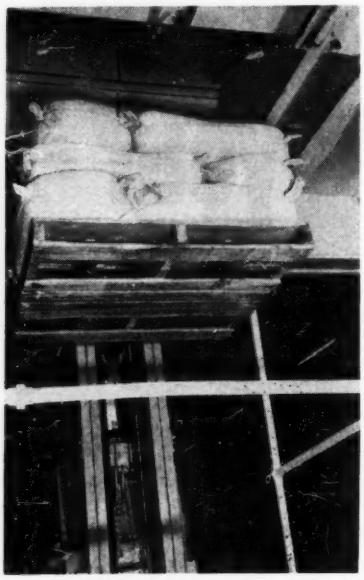
POW-R-TRUCK ELEVATORS

DESIGNED TO TAKE POWER TRUCK 'PUNISHMENT'

PACKAGING MECHANICS SECTION

The capless cans are deflected from the conveyor onto one of the 16 filling heads of the vacuum type filling machine. The heads are located on a circular plane and rotate continuously as the cans are filled with the required amounts.

The capping operation is more complex than usual because the caps used are square. A special feeding hopper and aligning wheels are necessary to position the caps correctly in the slide that feeds the capper. Two sets of rotating heads are used on this machine. The first one removes the caps from the hopper slide and positions them over the cans. The second rotating head chucks the cans, receives the caps from the other set of heads and then presses the two together to complete the package. Like the filling machine, the capping machine is also mechanically loaded and unloaded with the aid of the bottle conveyor. One operator is stationed at the capper, who watches the capping and filling operations. This operator acts as an inspector and checks each can to see that they are perfectly filled, capped and the sprinkler tops closed.



FORK TRUCK LIFTING raw materials through trap door to powder mixing department.

Packing With Dispatch

The conveyor which removes the full cans from the capper discharges the units onto a six-inch-wide canvas belt conveyor for delivery to carton packing. This operation requires the cans in a double row (they have travelled single file up to now). To do this without manual handling, two rotating turnstiles were installed, one on each side of the belt conveyor. They are synchronized to shuffle the cans so that each alternating units is placed beside the next one, forming two rows.

The cans of all sizes are put up in cartons containing one dozen each. This semi-automatic operation is performed by one operator and a carton packing machine. The operator slips an empty carton over the loading fixture and the machine fills it in two passes of six cans each. For utmost sales appeal, the cans in each carton face the front. This positioning originates at the can manufacturer's, where the units are packed in the required

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Dead weight does not necessarily mean high strength in boxes for materials handling. Truscon Steel Boxes are carefully engineered for maximum strength without superfluous weight. The proper thickness of steel is used in every box wall, and the wall is so shaped that it has unusual strength and rigidity for its weight. This assures long service under extreme conditions, and easier handling. Write for illustrated catalog on Truscon Steel Boxes and Skids.

Ask an experienced Truscon man to explain all the Truscon Steel Box and Skid features to you.

TRUSCON STEEL COMPANY

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position for this purpose. All equipment used in the filling-packing line is designed to maintain this position, and thus the need for manual sorting is avoided.

Here are the details on packing. The two rows of cans travel within positioning guides, which funnel them into the packer. Three cans enter at one time in each of two rows to give the necessary capacity of six cans. A ram pushes the six cans into the carton, as previously mentioned.

The full cartons (they are loaded in a horizontal position) are then dropped onto the carton gluing machine conveyor in a vertical position. This places the top and bottom carton flaps in position for the automatic folding and gluing which follow. The side flaps are tucked "in" and the end flaps "out" by flared guides. Glue applicating rollers deposit enough mucilage on the "flared out" end flaps to insure a secure bond. They are then folded automatically.

The cartons next enter the adjustable compression unit, which

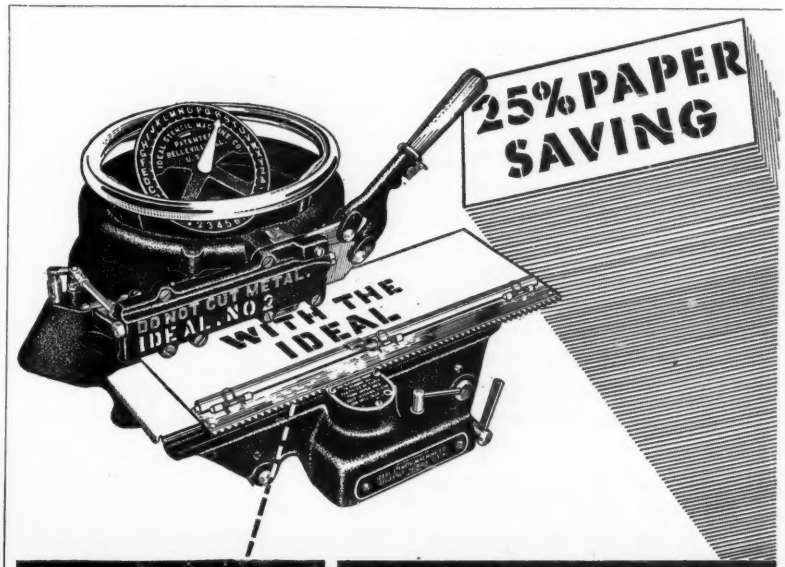
GLUER, COMPRESSION UNIT at left. The small cartons are then packed in corrugated containers.

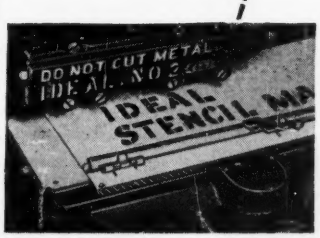
provides pressure and setting time for the mucilage. This unit is sufficiently long to hold each carton under pressure for one minute, which is adequate for the type of glue being used.

The compression unit, incidentally, is not synchronized with the rest of the line. A switch at the end of the carton sealing machine starts and stops the unit as cartons pass from one piece of equipment to the other. If this machine were synchronized with the others, a much longer length would be required.

The completely sealed cartons are discharged on a roller conveyor curve feeding a booster belt. The latter elevates the material to a convenient case loading height. An operator at this point sets up, glues, loads and seals the corrugated shipping cases. A 12-foot-long roller conveyor work table is used, and the operator works on six cases at one time. This "one-dozen-at-a-time" handling allows time for glue setting; it also fosters good motion economy through the multiple-operation principle. Incidentally, four cartons of one dozen cans each make a case of the large-size cans, while 12 cartons are required of the medium and small cans. A case sealing machine will be installed to replace the hand sealing when this

(Turn to page 59)





Here's the MINIMUM MARGIN GRIP that uses only ½" margin.

ONLY IDEAL HAS THE MINIMUM MARGIN GRIP

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Note the wide 1½" use of paper-consuming margin on this conventional stencil machine.

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Safe Procedures for Baby Chicks

PACKAGING MECHANICS SECTION

Baby chicks - - a fragile product that must be packaged efficiently. Here is how it's done.

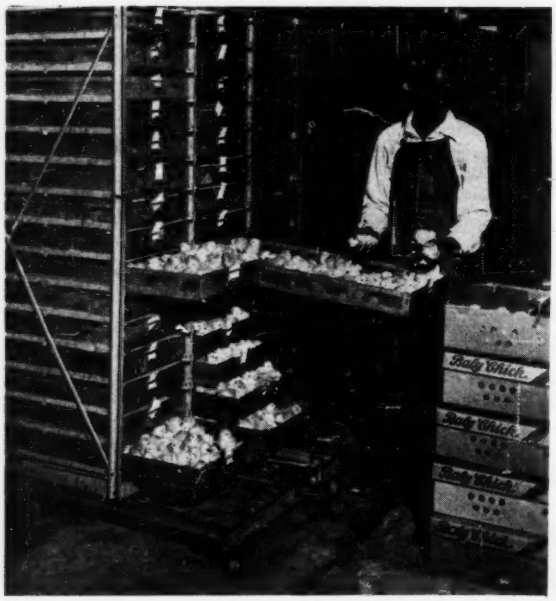
ON FIRST thought it is difficult to see where efficient material handling and packaging techniques apply to the hatchery business because of the limited production coupled with the light weight and small size of the product—baby chicks. However, investigation reveals that certain characteristics of the product, such as fragility and perishability, give added importance to the use of proper handling and packaging equipment. The Hatchery Dept. of J. D. Jewell, Inc., Gainesville, Georgia, illustrates the application of efficient equipment and methods in this industry.

The raw material, eggs, is placed in perforated sheet metal trays holding from 150 to 160 each. These are loaded in special racks in the incubators. The racks are constructed so they can be tilted from side to side, which keeps the eggs from drying out in one place. This tilting (30 degrees) is mechanized and automatic to effect one tilt every three hours. The eggs remain in the incubator for 18 days at a temperature of 99 degrees F. and are then removed and placed in larger hatching trays, allowing more room for the chicks when they hatch. These trays are then placed on a metal rack equipped with four wheels, which is designed to roll in and out of the hatcher. It has channel tracks built into its base for receiving and discharging the wheeled racks. Within three days the chicks have hatched and are ready for culling and packaging.

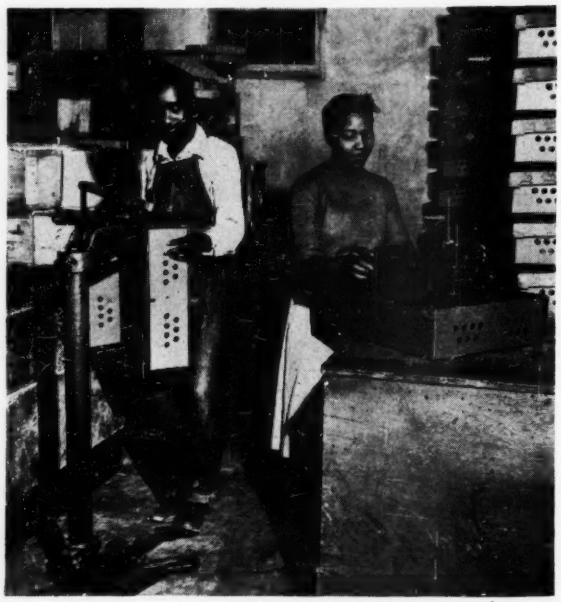
To remove the rack from the hatcher a special castered dolly is used. It is placed adjacent to the wheeled rack in the hatcher and latched to the base of the hatcher with a steel rod hook that is part of the dolly. The castered truck is then securely held in position for rolling out the wheeled rack with its load of trays. The deck of the castered dolly has channeled tracks which are identical in size and height to those within the hatcher. To remove the rack from the hatcher to the caster truck the operator needs but pull it from one track to the other. Positioned on the dolly, it is a simple matter to move the load anywhere within the building for unloading and packaging. The trays slide in and out of the racks.

As can be surmised, the baby chicks are extremely fragile and perishable and their packaging for shipment must be in specially designed paper-board boxes. These are of heavy corrugated paper and are received from the manufacturer

PACKAGING CHICKS directly from hatcher rack trays. Rack has been rolled partly from hatcher.



ASSEMBLING AND STAPLING shipping boxes for baby chicks. See details on operation in article.



knocked-down. To set up the box, four separate pieces are used; top, bottom and two dividers that also act as separators when assembled. Each of these pieces has partially perforated air holes in it. The user pushes out as many of these as are required by the weather at the time of shipment. The holes are made with a wooden doll rod while the pieces are still in the flat state. Approximately two dozen holes are punched at one stroke.

The use of metal trays, wheeled hatching racks, castered dollies, stapling machines and specially constructed corrugated paper boxes describes the handling and packaging equipment used. It enables J. D. Jewell to give the fragile and perishable product the protection it must have for efficient processing.

For setting up the box, a foot-operated stapling machine is used, as shown in a photo. Usually two staples are applied at each closure point. Two dividers are used per box which separate the container

PACKAGING MECHANICS SECTION

into four compartments, each for 25 baby chicks. These are made so the top of each protrudes about ½ inch above the box when assembled to allow for additional air circulation.

When a hatch is ready these boxes are loaded directly from the hatcher racks, 100 chicks to the box, which is 16″ wide x 18″ long x 6″ high. Because the packaged chicks must be stored for as long as a day, a rack was provided that holds one day's production.

BABY POWDER . . .

(Continued from page 57)

line is speeded up to 180 cans per minute.

Immediately adjacent to and on the same level with the roller conveyor work table is a live roller conveyor. A slight push from the operator, and the powered conveyor does the rest. The live rollers discharge the cases onto a descending belt, which delivers them to a live roller conveyor in the conveyor tunnel below. Here these cases, as well as those from other lines, are consolidated and routed over a conveyor line that delivers them to the warehouse 1,000 feet distant. In the warehouse, the cases are discharged on an oval sorting conveyor. Operators remove cases of like products and place them on pallets for storage.

As mentioned at the outset, the mechanical packaging line is adjustable to handle all three sizes of cans. Only four operators are required along the entire line, with resultant economy. At the same time the operation has given Johnson & Johnson the capacity for keeping pace with the expanding market of a new industry.

The FLOW DIRECTORY OF MATERIAL HANDLING, a 400-page volume, is a valuable reference guide. It may be ordered from FLOW Magazine.

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SAFER — because Corroflex *cushions* inside and *covers* outside, providing a resilient protection against the shocks of shipping. Greatest protection—with multi-wall cushion — can be added where needed.

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Send for your Free Trial offer of Corroflex and also the famous Speed Packing Manual of short cuts in packing.

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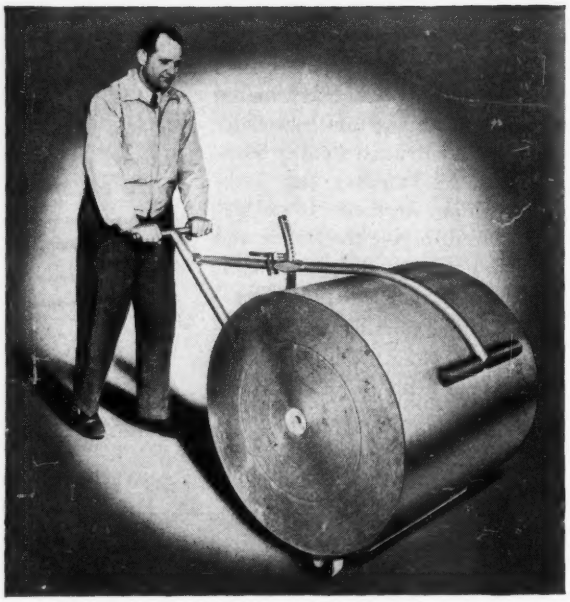
THE NEW IRONBOUND RŌL TRUK



LIFTS GRIPS & CARRIES DRUMS, PAPER ROLLS, KEGS, REELS, Etc.

● The RolTruk meets the growing demand for a truck, that easily lifts and moves heavy cylindrical objects, yet is non-complicated in design. One of the features of the RolTruk is the hold-down arm. This arm securely grasps the roll in a vise-like grip and the finger-tip release catch must be manually disengaged before the roll can be released. Thus accidents are prevented and damage to product is eliminated. The RolTruk can be adapted to handle many items not mentioned. If you have a cylindrical product write the Ironbound engineering department fully describing its characteristics. We will be glad to make recommendations without obligation.

WRITE FOR ILLUSTRATED LITERATURE!

IRONBOUND

BOX & LUMBER COMPANY

Materials Handling Division

30 HOFFMAN PLACE • HILLSIDE, N. J.

Ironbound

SEMI-LIVE SKIDS
SKIDS • DOLLIES
FLOOR TRUCKS

PNEUMATIC TIRES . . .
(Continued from page 32)

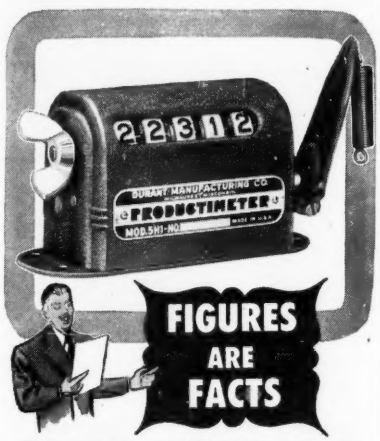
tled goods on a beverage hand truck or 10,000-pound loads of strip steel rolling on a pneumatic-tired trailer, air provides the cushion that helps protect material and equipment, gives sure-grip traction, and easy rolling over paved, unpaved or hard-packed dirt floor surfaces.

ACKNOWLEDGMENTS

FLOW acknowledges with thanks the photos and data provided in connection with this article by: General Tire and Rubber Co., The B. F. Goodrich Co., Firestone Tire and Rubber Co., Goodyear Tire and Rubber Co., City Machine and Wheel Co., U. S. Rubber Co., Clark Trucktractor Div., Hyster Co., Towmotor Corp., Carnegie-Illinois Steel Corp., and Geneva Metal Wheel Co.

$1500 In Prizes

See the announcement of the FLOW Cost Analysis Contest, page 39 of this issue. Write us for your entry blank. Your paper may win one of the generous cash prizes.



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Productimeters installed on your conveyors at points of receiving and shipping uncover losses in materials-handling. They register count of pieces . . . lineal feet . . . bottles . . . cases . . . or revolutions! There's a Productimeter for practically every industrial need—send for bulletin No. 100.

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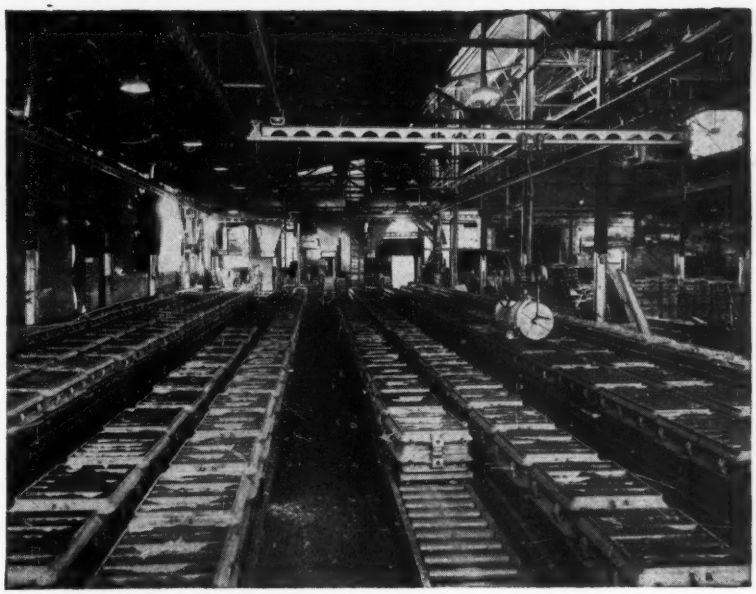

Staying Power

that means economy

There is one thing that can always be said about conveying equipment that goes into heavy industry — it gets an awful beating. And, it's got to be tough to stay on the job. Plant operating men, responsible for keeping costs down, know that very well — and so do conveyer people who have had years of experience in designing conveying equipment that will work under severe service.

Mathews Engineers like heavy jobs, probably because they've handled so many of them. They've put gravity and power conveyers and special conveying machinery in just about every place it can be used to advantage in foundries, steel plants and brass mills.

For these industries, Mathews designs and builds equipment that is heavy enough to stay a long time in a rough game.

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MATHEWS CONVEYER COMPANY WEST COAST
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MATHEWS CONVEYER COMPANY, LTD.
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Engineering Offices or Sales Agencies in Principal American and Canadian Cities

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You'll move materials faster, at lower cost with WELD-BILT "job-engineered" equipment! Call on your nearby "Weld-Bilt" representative for money-saving suggestions.

Weld-Bilt Pallet-Type Hydraulic Lift Truck

"Palletizing," with Weld-Bilt Pallet Trucks, shows amazing savings in many plants.

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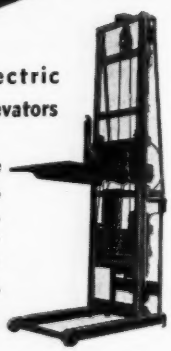
Improves storage efficiency. Single, double telescopic, hinged types, motor or hand operated. Capacities, 500 to 4000 lbs.



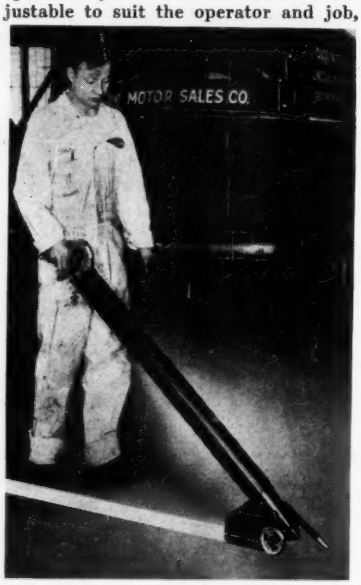
Write for catalog and details—also on Weld-Bilt Platform and Two-Wheel trucks, Skid Platforms, Tiering Machines.

WEST BEND EQUIPMENT CORP.
241-5 Water St., West Bend, Wis.
Materials Handling Engineers

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

LINE MARKER

NP226—A gravity feed line marking machine, the Florine, is produced by H. C. Sweet Co. The device can be operated by one man. Paint flow is adjustable to suit the operator and job,



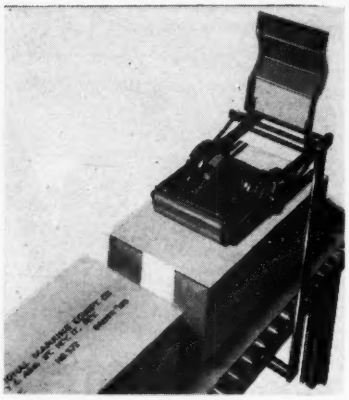
with pistol-grip operation of the nozzle. The machine holds 1-½ gallons of paint, lacquer or whitewash. It can be set to make lines two, three or four inches in width. Weighing less than 20 pounds, it can be guided and controlled with one hand.

MINE TIMBERING MACHINE

NP227—Baker Industrial Truck Division of The Baker-Raulang Co. announces the production of battery-powered pneumatic-tired timbering machines for work in conjunction with trackless gathering systems in coal mines. The machine is of the tractor type, mounting a boom, hydraulically controlled, which lifts the cross bar holding it against the roof while posts are cut to length on the circular saw mounted on the machine. In operation the timbering machine draws a two-wheel trailer carrying bars, posts, cap boards and wedges. At the face, a cross bar is moved on rollers from the trailer across the deck of the machine and into the boom saddle. Being battery powered the equipment can follow any path across the face. The timbering machine is manufactured in two designs. For high seams, the boom is centrally mounted and in tramming position has 46″ overall height with 10″ ground clearance. For low seams, the boom is mounted forward and overall height is 31″ with 6″ ground clearance.

CARTON MARKER

NP228—An Autopoint Conveyor Model for printing variable information on cartons has been announced by National Marking Equipment Co. It is designed for addressing, coding, dating and imprinting contents and quantities on cartons and cases during long runs. The marking device is mounted on the

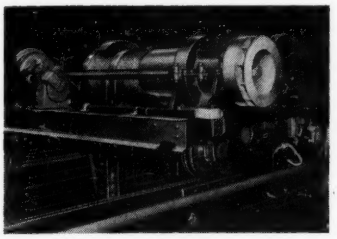


conveyor, packing, wrapping or sealing machine with the brackets supplied. As the carton moves past the marker, the imprint is applied by rubber dies hooked to rotating drum and/or by insertable type. Inking is done through felt rollers. Return springs automatically reset the printing drum after each imprinting. The printing area is approximately six by 12 inches but the drum can be made smaller or larger as required.

MAGNETIC CRANE CONTROL

NP229—A new principle of crane control that eliminates mechanical load brake has been announced by Harnischfeger Corp. Called Magnetorque, this AC crane control is designed to provide hoisting smoothness and accurracy. It governs the action of the hoist motor which is directly connected through the crane gear train to the hoist drum. The hoist motor drives the load both up and down but cannot be energized until

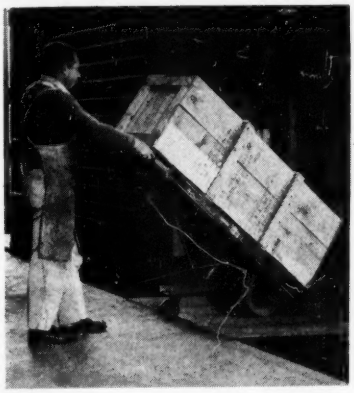
the Magnetorque unit has been excited. There are no rotating electrical parts in the Magnetorque unit. Magnetorque



is also available with drum type or full magnetic control. It can also be furnished with all-position dynamic braking.

HAND TRUCK SUPPORT

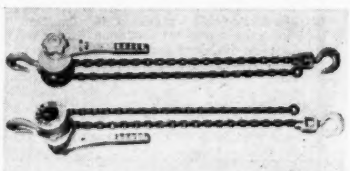
NP230—A Universal Tilt Truck Attachment produced by Melooz Mfg. Co., is an adjustable support for 2 wheeled hand trucks which allows any standard truck (except aluminum trucks) to be



converted into a balanced three wheeled truck which carries the entire load. A telescoping tube, extending upward from the platform to the top crosspiece of the truck, is adjustable by finger-tip control so that the truck can be tilted and locked at any angle. The leverage plate extends over the third wheel. It provides free steering in any direction. The operator carries no weight but merely pushes or pulls the load to its destination.

LEVER HOIST

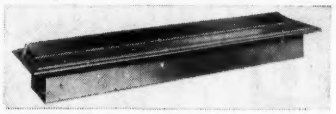
NP231—Shaw-Box Crane & Hoist Division of Manning, Maxwell & Moore, Inc., announces a lever-operated hoist, the "Tugit", available in capacities of one and two tons. Lifting is effected



by a lever acting on a gear train. Interposed between the operating lever and the lifting pocket wheel is a Weston type load brake. The operating handle is 12 inches long, operating in close quarters. The one ton capacity unit weighs 14-½ pounds, and the two ton unit weighs 18-¾ pounds.

NON-ELECTRIC SEPARATOR

NP232—A heavy duty, non-electric magnetic separator for highly abrasive, deep flowing materials, has been de-



veloped by Eriez Mfg. Co. Alnico castings provide uniform magnetic field for removing tramp iron from heavy, loose flowing materials such as coal, rock and cinder products, paper slurries, textiles, bulk ores, chemicals and foods. The effective cleaning range varies depending upon material and operating conditions involved. Face plates are built of steel and are furnished in either a flat or stepped pole face. Two models are available. One is for stationary installation in open chutes or for suspended applications, while the other, equipped with hinges and latches is recommended for enclosed chutes and machinery hoppers. The magnets are available in sizes from 6" up.

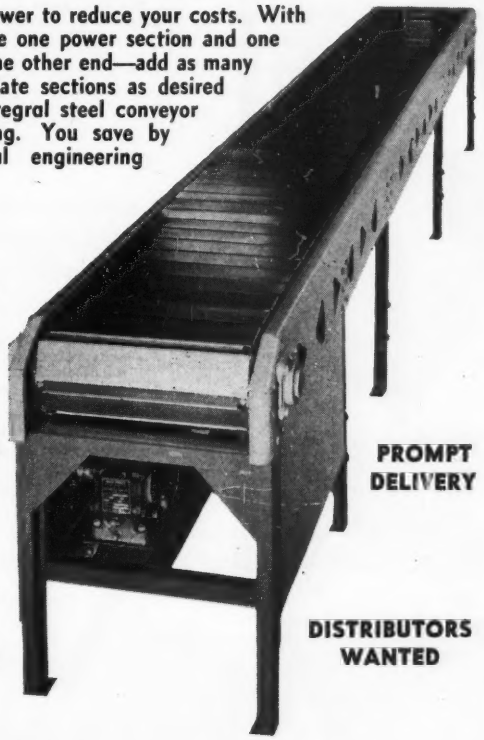
PLANT SWEEPER

NP233—A power sweeper, equipped with a 36" revolving brush and vacuum dust control, which the manufacturer claims enables one man to sweep up to

ADD-A-SECTION
FLEX-E-UNIT
STEEL BELT CONVEYOR

It's Custom Built
Yet Priced At
Production Line Costs

We've found the answer to reduce your costs. With Flex-E-Unit you have one power section and one take-up section at the other end—add as many 4 or 5 ft. intermediate sections as desired for a completely integral steel conveyor up to 175 feet long. You save by eliminating "special engineering fees."



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- Tilts for Assembly Work (special)
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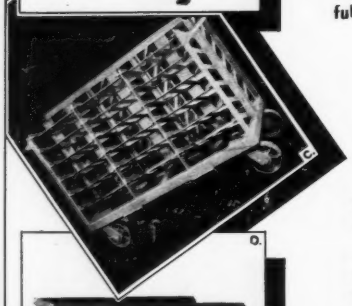
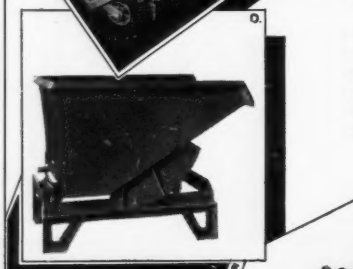
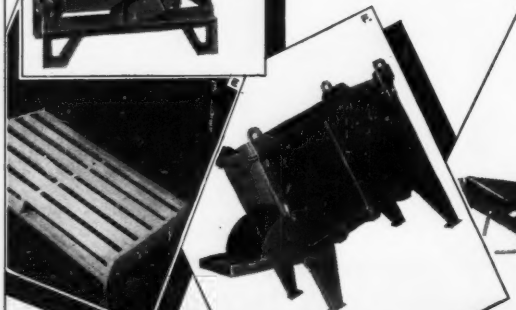


A few of the popular Brusco items include:
A — Style "C" Brusco Drop-Door Parts Box with Adjustable Stand
B — Casting Cooling Box
C — Ring Gear Truck
D — Brusco Dump Hopper
E — Brusco Steel Pallet
F — Heavy Duty Drop-Door Box
G — Automotive Panel Rack





BRUMMELER STEEL PRODUCTS CORPORATION
DEP'T 55 GRAND RAPIDS . MICH.

44,000 square feet of floors per hour, has been developed by the G. H. Tennant Co. The machine has a starter, operates like an automobile and is powered by a 6 h.p. air cooled gasoline engine. The sweepers can pick up dust

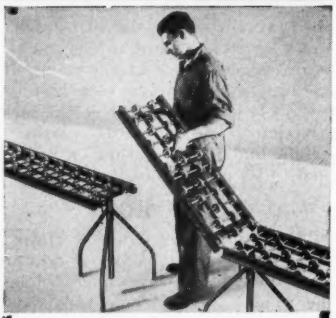
and litter at four to six m.p.h., and clean a path 36" wide. Its combination revolving brush and vacuum system is "sealed" to the floor by a snug-fitting flexible rubber skirt. One foot pedal controls forward or reverse motion and another pedal serves as a foot throttle. The removable brush can easily be raised or lowered by a lever. A steering wheel permits sharp turns (128° total arc).

NEW PUSHER DEVICE

NP234—Simplified design, more efficient hydraulic operation and con-

SAGE

GATED SECTIONS



For use where it is necessary to run a conveyor line across an aisle to eliminate disassembly. Standard 36" lengths. Furnished with or without counterweights. Standard widths to fit all conveyor sizes. Special lengths made to order.

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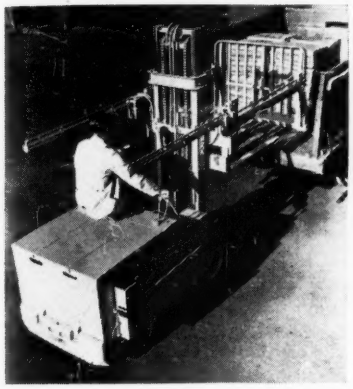
siderable decrease of weight are features of the improved Pusher device for use on Clark fork trucks, it has



been announced by the Tructractor Division of Clark Equipment Co. In the newly designed pusher, the pusher rack which travels horizontally to move material off the forks, is connected to two hydraulic cylinders which receive equalized hydraulic pressure through a flow divider. The cylinders are supported by two horizontal slide channels mounted on roller bearings. Side guard members provide protection to slides and cylinders. Standard and maximum forward travel of the pusher rack is 55½ inches. This may be reduced by 1-inch increments to meet special needs. Standard forks may be used for han-

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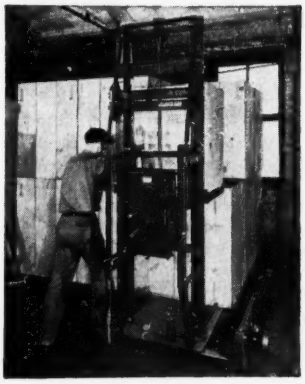
REG. U. S. PAT. OFF.
PORTABLE ELEVATORS

NEVER A SICK DAY!



REVOLVATORS are not temperamental. They are strong and simple in construction—will not break down under heavy loads or constant use. Pile materials with these mechanical men, and furnish additional protection to your live men from rupture, strain, and over-fatigue. REVOLVATORS save time and money.
Electric models for heavy, continuous work: inexpensive, light hand machines for occasional use or where electric current is not available. Lift any practical size and weight to any practical height.

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DESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT
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It costs money to keep boxcars standing on the siding. And unloading by hand doesn't help a bit. Demurrage can run up a sweet bill before you know it. But, what's more important is to get the goods where they can be turned into a profit . . . fast.

How to do it? Listen. Two men with a few sections of Rapid-Wheel Conveyor and a Rapid Power Booster can unload a car and stack the goods in storage in a couple of hours.

It's wise to conveyorize . . . not only for loading and unloading, but all through the plant. Why not take a good look at your handling costs. Or, let us make an analysis and suggest equipment that will do the job most efficiently and economically. Write us today. There's no obligation.

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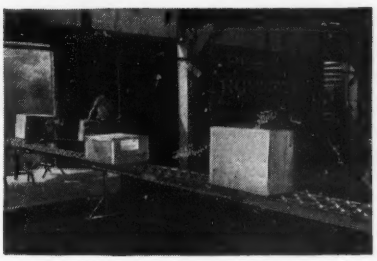
IT'S WISE TO CONVEYORIZE



Rapids-Standard
MATERIAL HANDLING EQUIPMENT

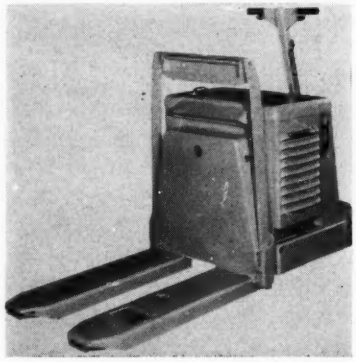
dling palletized unit loads. Where loads are to be removed directly from forks, multiple forks—usually five—are used.

STENCIL INK

NP235—Diagraph-Bradley Industries, Inc. announces that a new formula for all colors of Brit-Mark Stencil Ink has been developed and is available in seven colors: black, white, yellow, green, blue, orange, and red. Its primary purpose is to stencil upon metal, glass, celophane, or other nonporous surfaces, but it works on corrugated cartons or wooden crates.

SKID AND PALLET TRUCK

NP236—Materials Handling Division of The Yale & Towne Mfg. Co has introduced a new Worksaver truck for handling both skids and pallets. The new combination "walkie" is essentially a pallet-type Worksaver. It has been fitted with a fabricated super structure which lets down over the pallet lifting-frame to make the unit suitable for handling skids. The standard model can handle skids from six to 12 inches high. When not in use the frame locks into a verticle position and the truck can be used for handling pallets. Forward and reverse speeds of the Worksaver are controlled from the handle of the truck. Lifting is controlled from a switch located on the front of the



truck body. Both motivation and lifting mechanisms are electrically operated.

KEG TRUCK

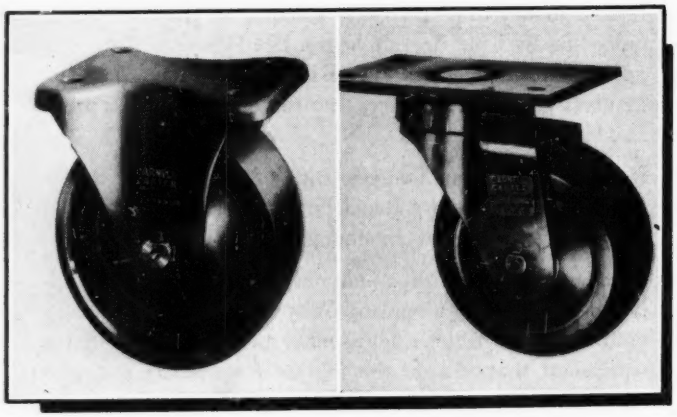
NP237—A lightweight key truck has just been developed by the Palmer-Shile Co. A lightweight truck (weighs only 22 lbs. with metal wheels or 15 lbs. with rubber tires) it can be picked up with one hand. It is operated by push-

ing it against a keg and pulling back the handle. A sliding safety catch holds the lip or open end of the keg. The keg is gripped firmly at the base by means of two heavy steel spikes. It is constructed of a heavy tubular steel, welded throughout, and is equipped with metal, rubber or pneumatic wheels mounted on roller bearings. The overall standing height is 45" and width 16".

SEPARATOR CHUTE

NP238—Material Movement Industries, Inc. announces that its lightweight Tote-All Bulk Material Conveyors are now available with an adjustable chute that removes all stray iron from the bulk material being conveyed. The chute, which may be detached, has a powerful, permanent magnet built right into it. It traps nuts, bolts, nails, wire, thus protects valuable machinery from breakdowns, helps eliminate product contamination and reduces the danger of fire and explosion caused by "friction sparks" from tramp iron. It may

DARNELL
Casters & Wheels



Darnell Double Ball-Bearing Casters and E-Z-Roll wheels reduce floor wear to a minimum, lengthen the life of equipment and increase the efficiency of employees—Write for 192 page Darnell Caster and Wheel Manual.

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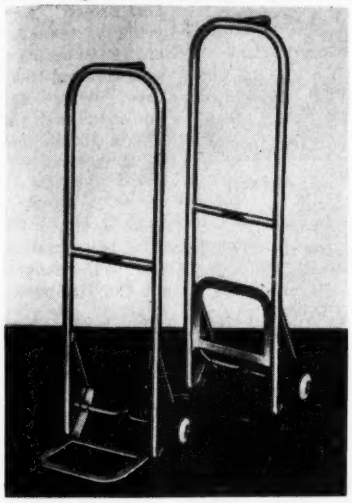
LONG BEACH, CALIFORNIA,
60 WALKER ST., NEW YORK, N.Y.
36 N. CLINTON, CHICAGO, ILL.

be used with any non-metallic material such as chemicals, grains, foods, coal, fertilizers, etc. The magnet is made of Alnico and is non-electric. Maximum recommended speed for efficient operation of magnet is approximately 100 fpm.

HINGED-NOSE TRUCK

NP239—Lewis-Shepard Products Inc., is offering a Bottlers' Case Truck. The

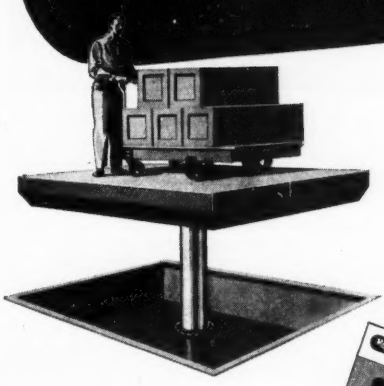


new case truck is of tubular steel construction with wheels turning on roller bearings. Magnesium hubs are furnished, and wheels are equipped with 6"

(Turn to page 73)

NEW LIFTING EQUIPMENT

Uses Economical Oildraulic Power



Use Oildraulic power to lift loads directly from plant floor to trucks, freight cars or different building levels. Rotary Levelators speed plant traffic, conserve manpower, cut costs. Save plant space, too . . . no need for ramps. Plant floor can be poured at grade. Safe, dependable, economical. Installation simple and inexpensive.

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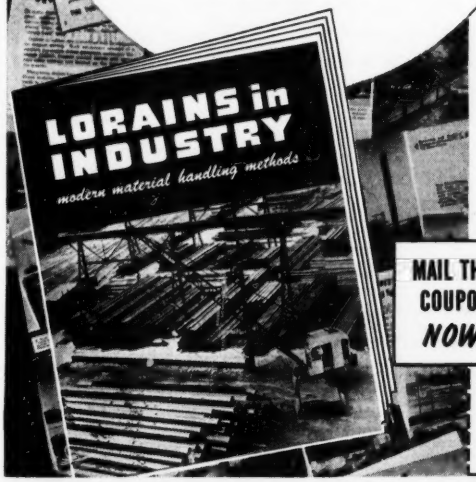
*Reg. U. S. Pat. Ofc.

43 WAYS TO CUT MATERIAL HANDLING COSTS!



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• This new free bulletin pictures and describes how crawler and rubber-tire mounted Lorain Cranes are serving industry by speeding the flow of materials; doing scores of other miscellaneous jobs—all at a saving of labor, time and money.

Mail this coupon today for pictorial proof of the dollar and cents advantages of "cranepower" over manpower.

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LORAIN, OHIO

THE THEW SHOVEL COMPANY
Lorain, Ohio
Please send me your new free bulletin titled "Lorains In Industry."
Name_____ Title_____
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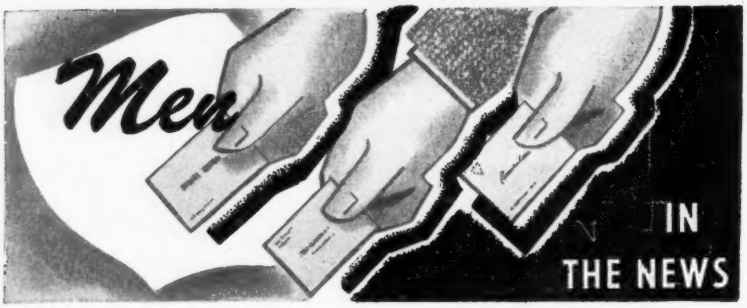


JAMES G. WITTE, who formerly directed the packaging activities of Montgomery Ward & Co., has formed the Witte Co., Packaging Consultants, with offices at 20 East Jackson Blvd., Chicago. Mr. Witte's experience, aside from four years with Montgomery Ward includes 11 years in the shipping container industry. During World War II he served as an officer in the container division of the Navy, in charge of all Navy Packaging Activities in the West Coast area. He is president of the Illinois Division of the Industrial Packaging Engineers Assn., and a member of its national directorate. During the past several years Mr. Witte has lectured before numerous management groups on the merchandising aspects of packaging. He was a speaker at the Second National Material Handling Exposition and served as a judge in the 1947 FLOW Cost Analysis Contest.

J. G. Witte

* * *

MANSAVER INDUSTRIES, INC., has appointed Albert C. Uihlein as sales engineer. He will assist in the analysis of inquiries and will also devote his time to study of new applications for grabs. Mr. Uihlein was formerly with the Engineering Department of the American Steel and Wire Co.

* * *

A. O. ANDERSON has been appointed senior field engineer of the western Division for Rack Engineering Co. He was formerly Production Control Manager of Ditto, Inc., Chicago, Douglas Aircraft Co. and Lockheed Aircraft Corp., and is a graduate of the University of Southern California, School of Engineering, Chicago Technical College and the American Institute of Banking in Chicago.

* * *

THOMAS A. EDISON, INC. Instrument Division, has announced the appointment of Andrew A. Priest as factory manager. Priest has 20 years of management experience with General Electric, Westinghouse, National Union Radio and R. C. A.

A. A. Priest

* * *

FAY BRAINARD has assumed the newly-created position of special assistant to Eugene Caldwell, general manager of the Hyster Co. Brainard's duties are expediting projects in methods, inventory control, and similar fields. He has been plant engineer of

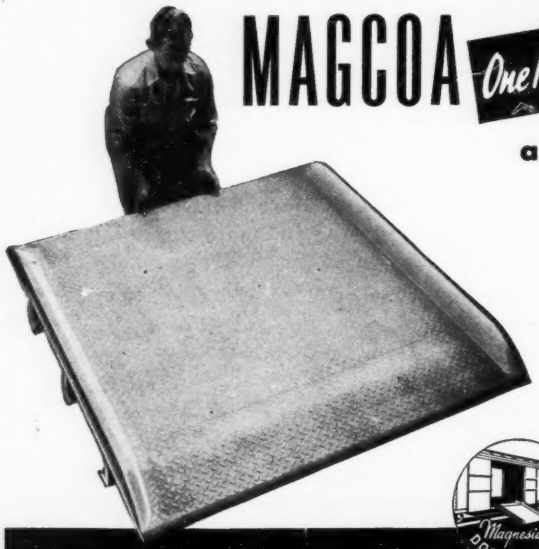
Fay Brainard

Svanta Eikrem

REDUCE YOUR DOCKBOARD WEIGHT 70%

MAGCOA One Man MAGNESIUM DOCKBOARDS

are easier... faster... safer handling



Use of magnesium, the world's lightest structural metal, makes it possible for one man to handle Magcoa Dockboards with ease. The lighter weight speeds up loading and unloading operations . . . cuts down danger of hernia and mashed feet or hands.

Engineered like a bridge to carry heavy loads, Magcoa Dockboards have a special "curb design" safety stringer* to prevent drive-off. Custom-built from basic standard design to fit the requirements of your particular docks.

Write for Estimate Data Sheet

NEW LIGHTWEIGHT MAGCOA HAND TRUCKS

With rigid, durable strength comparable to steel trucks of much greater weight. Built of tubular magnesium with rubber tired, ball-bearing cast magnesium wheels. Available in 3 sizes.

LIGHT STRONG MAGCOA BARREL SKIDS

Weighing as little as 25 lbs., yet with a capacity of 1,000 lbs. They're easy to handle . . . rugged in performance. Standard widths permit handling of 22 inch or larger diameter drums or barrels.

*Pat. Applied for

MAGNESIUM COMPANY OF AMERICA

One North La Salle Street, Chicago 2, Ill.

EASTERN DIVISION—30 Rockefeller Plaza, New York 20, N. Y.
WESTERN DIVISION—831 S. Flower Street, Los Angeles 14, Calif.

the Portland plant since joining Hyster in 1942. Svante Eikrem has been named the plant engineer. Since joining the company in 1943 he has worked on assembly line layout and on tool design in the Portland plant.

* * *

YALE & TOWNE MFG. CO. announced the unification of all sales and service facilities for its electric truck, hand-lift truck, and dial scale divisions at the Railway Exchange Bldg., 80 E. Jackson Blvd., Chicago 4, under Arthur H. Dobler, regional manager. S. A. March will continue in advisory and consulting capacities. With Dobler will be C. M. Barteleme, regional sales manager, T. J. Brunswick, E. E. Johnson, H. L. Marquard, Fred P. Mignin, R. A. Rieger, W. R. Saunders and Roy L. Wolter.

A. H. Dobler

* * *

J. L. FERGUSON CO. announces the election of its sales director, H. Lyle Green, to the position of president. R. A. Stephen, formerly executive vice-president and treasurer, becomes vice chairman, and J. L. Ferguson, Sr., chairman of the board. Miss Estella L. Koenig continues as a director and secretary of the board.

* * *

ROY J. KELLER, general sales manager of TelAutograph Corp., has been elected a vice president it has been announced by Robert L. Spotts, president.

* * *

LLEW L. ABBOTT, Jr., after 12 years with the U. S. government, has joined the staff of Montgomery Equipment Co., Chicago, as assistant general manager. Abbott directed procurement and fiscal activities of the Army Transportation Corps in Chicago and New Orleans and more recently has been connected with the Atomic Energy Commission, Office of Finance. Montgomery Equipment Co. has also added a new service and parts division to its Chicago facilities.

L. L. Abbott

GEORGE C. McMULLEN, with the Tyson Bearing Corp. for 16 years, has been appointed vice president of sales. W. H. Oexle has joined Tyson as general sales manager. Herschel J. Deal, vice president, is now in charge of the midwest territory and will make his headquarters in Chicago. Ivan C. Mann, formerly manager of replacement sales, has been named assistant sales manager. R. R. Flaisig, the new representative in the southern Ohio territory, makes his headquarters at the factory; E. M. Smith, northeastern territory with headquarters in Philadelphia, and Carl M. Behm, representative in northern Ohio.

JAMES R. SEBASTIAN became president and general manager of the Rapids-Standard Co., Inc. He was formerly general manager. Sebastian succeeds Lloyd C. Backart, who was named chairman of the board. Backart, who was also sales manager, will continue in that capacity to direct merchandising operations and long range planning. He is a member of the 1949 Materials Handling Exposition committee. Other officers elected were: secretary-treasurer, Roger S. Calvert; vice-presidents Paul F. Millet, Howard R. Pearl and Robert L. Gunnell; and assistant secretary and treasurer Eugene L. Hummel.

"What-No People?"

- Horizontal and vertical wheel units alternate in a continuous chain traveling through rectangular steel tubing.
- Complete flexibility. Easily installed, easily altered.
- SAFE—all moving parts fully enclosed.
- Low first cost. Low power factor.
- Load capacity: Single suspension 65 lbs.—multiple suspension 125 lbs. at 1-foot spacing; 250 lbs. at 2-foot spacing. Maximum total loading depends on length and contour.
- Standard horizontal or vertical curves—two-foot radius. (Stock load pendants including automatic turning units available.)

That's right, there's nobody in the picture because Richards-Wilcox Zig-Zag Continuous Power Conveyor is doing all the work *and at lower production cost.* It's a clear example of how Zig-Zag eliminates costly man-handling and provides greater production at reduced cost.

Simple and flexible, Zig-Zag is a steel, tube-like track through which travels a specially constructed chain carrying unit loads up to 250 pounds, from 1 inch to 60 feet per minute. Learn how Zig-Zag can do a job for you—write or call for catalog A-83.

1880 • Over 68 Years • 1948

Richards-Wilcox Mfg. Co.

"A HANGER FOR ANY DOOR THAT SLIDES"

AURORA, ILLINOIS, U.S.A.

Branch Offices

909 Santa Fe Ave., Los Angeles 21 • 343 Rialto Bldg., San Francisco 5 • 6903 57th N.E., Seattle 5

With floor load capacity only 150 pounds per sq. ft. . . .

Powered Hand Pallet Trucks Solved the Problem

Planning to adapt the pallet method to a building with floor load capacities too limited to support both heavy-duty power equipment and palletized loads? This on-the-scene report suggests a solution.

ELI LILLY and Company of Indianapolis, manufacturer of pharmaceuticals and biologicals, solved an interesting problem when building handicaps seemed to make pallet handling impractical. The company's postwar enlargement program of its storage facilities left the operating department with the problem of using a multi-story building recently leased, which had a floor load capacity of 150 pounds per square foot. The capacity of elevators was 5000 pounds.

The company had been using the pallet system in its main plant. The engineers, aware of its relative economies, were reluctant to revert to the "grunt and muscle" methods of the past in the newly acquired warehouse. The handicap was overcome by the use of two types of powered pallet hand trucks, light in weight, which were capable of operating within the restricted facilities.

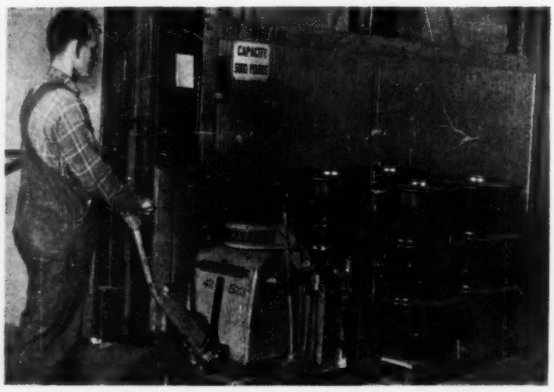
The outlying multi-story warehouse receives from the operating plant palletized materials which come in bags, bales and barrels. The load units are unloaded by the powered pallet hand trucks, low-lift type. This equipment is light enough to be transported with loads on the 5000-pound capacity freight elevators. Thus these units are handy in delivering the palletized material to the various locations on the several floors.

To utilize the cube, the pallet loads must be stacked, an operation for which heavy-duty fork trucks cannot be employed on these floors. The answer to this problem is also shown in the accompanying photos —a powered high-stacking type pallet hand truck.

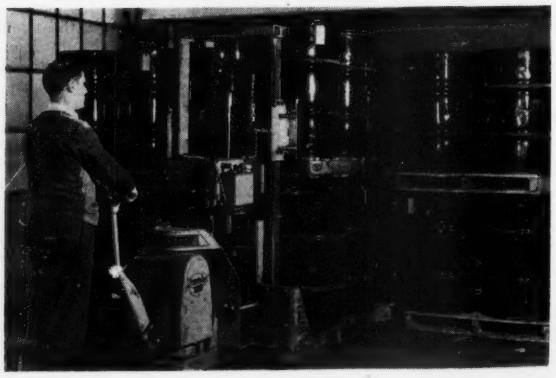
The two types of machines—the low-lift and the stacking types—thus complement each other. The low-lift performs the unloading of incoming motor vehicles and delivers the material to location, while the high-lift stacks and detiers the loads. In this way maximum utilization is obtained from the cube despite the limited floor load capacities.

Utmost man efficiency is obtained since each of these trucks requires but one operator, who manipulates all loads by push-button controls built into the handles of the equipment. A factor of equally great importance to the Lilly Company is that this powered hand truck operation permits the pallet method to be extended to the warehouse from the operating plant, thus providing a uniformly economical method in the interplant operation.

INTER-FLOOR MOVEMENT with motorized pallet hand truck. Note elevator capacity.



HIGH-LIFT "walkie" stacks to floor load limit. Floor load capacity is 150 lbs.



Activities of Organizations

FORMATION of a new technical professional society for industrial engineers has been announced. The American Institute of Industrial Engineers (AIIE) has been formed to raise the standards of the engineers' profession; to protect society and industry through the identification of qualified Industrial Engineers; to cooperate with and promote the aims of the National Society of Professional Engineers; and to aid, in all ways possible, colleges and universities devoted to teaching Industrial Engineering. Membership is based upon professional attainment in the field. Only graduates from accredited curricula in industrial engineering; licensed professional industrial engineers; or men with neither of the foregoing qualifications, but who can show professional accomplishment in the field, may apply for membership. The organization has 40 members. Eldon D. Raney, of Ranco, Inc., Columbus, O., is the present national president, and Wyllys G. Stanton, Associate Professor, Industrial Engineering, Ohio State University, is national executive secretary. For further information, write Prof. Wyllys G. Stanton, 214 Industrial Engineering Bldg., Ohio State University, Columbus 10, O.

* * *

DIEFENDORF ELECTED

THE Michigan Division, Industrial Packaging Engineers Assn., announces the election of the following officers: Harry G. Diefendorf, packaging and material handling engineer, president; F. F. Holt, G.M.C. Truck and Coach Division, General Motors Corp., vice president of packaging; J. Alex Gordon, Gordon and Kinney, vice president of materials handling; T. C. Lewis, Micromatic Hone Corp., vice president of transportation; R. B. Hiltz, Hinde & Dauch Paper Co., secretary; Edmund R. Meyer, Ford Motor Co., treasurer; C. E. Cox, Gerrard Steel Strapping Co., chairman, program committee; I. E. Thomas, Ford Motor Co., chairman, membership committee; and V. Lee Edwards, The Chas. A. Strelinger Co., chairman, publicity committee.

The Michigan Division meets monthly at the Detroit Leland Hotel to discuss the problems confronting industry in the packaging, handling and transportation of materials. At a recent meeting the group discussed "Loss and Damage Claims and their Relation to Prevention Methods." Principal speakers were: Richard Wheeler and Oscar Cousino, U. S. Postal Service, who explained to the members the troubles encountered by the Post Office in handling of improperly packaged parcel post; B. H. Elzey, of Railway Express Co., who discussed the subject from the point of view of the express company; Thomas E. Lewis, traffic manager, Micromatic Hone Co. and Art Schroeder, Michigan Central Railroad, led the discussion of carload and less than carload rail shipments.

* * *

I.P.E.A.A., Michigan Division

KENNETH L. RAYMOND, Experimental Engineer of General Motors Corporation, Pontiac, addressed the Michigan Division, Industrial Packaging Engineers Association, at their regular monthly meeting, March 24th, held at the Detroit-Leland Hotel, Detroit, Michigan. His topic was "Laboratory Testing of Packaging Materials."

C. H. Davis, Division Manager of the Reynolds Metal Company, discussed the increasing prominence of aluminum in the preparation of packaging material.

* * *

NORTHEASTERN Ohio Division of the Industrial Packaging Engineers Assn. held a dinner meeting, April 28 at Hotel Hollenden, Cleveland. An address, "Materials Handling in Modern Printing Operations," was presented by

More than ever it's vital in these days of material scarcities that tonnage moves in and out fast—with minimum cost.

So *Shop Mule* industrial tractors are at the peak of their popularity. Powered by the famous International engines, remarkably maneuverable, low in operation and maintenance, they sustain their reputation as America's most versatile industrial tractor.

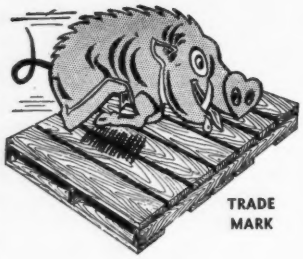
CONDENSED SPECIFICATIONS MODEL J233 SHOP MULE

Engine—International GRD 233. Six cylinder, 3-5/16" bore, 4½" stroke. Clutch and transmission—single plate 10" dry plate clutch, selective sliding gear transmission, 3 forward and one reverse speed. Chassis—Steel plate, all welded structural. Heavy steel front fenders and bumper. Cast drive wheel fenders, dual pneumatic drive wheels. Length, overall, less coupler—102". Width, overall—66". Height, overall—61". Universal type coupler is standard. Drawbar effort—4500 lbs.

SHOP MULE INDUSTRIAL TRACTORS

W. F. HEBARD & CO.
CHICAGO 9, ILLINOIS

CREATORS AND MANUFACTURERS OF SHOP MULES SINCE 1918



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Dependable quality Pallets—plus dependable service!

Order our rounded corners—protect both pallet and merchandise—and our Style 5 Corner-Lock 4-Way Lite-Weight Pallet for longer life. Write for descriptive folder.

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Plant and Sales Office in
PINE BLUFF, ARKANSAS

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Marshall Haywood, Jr., vice president of the Haywood Publishing Co., Chicago. Appearing on the program with Mr. Haywood was Paul O. Vogt, I.P.E.A.A.'s national president.

MATERIAL HANDLING Institute Activities

Ed Aukens, consulting engineer, spoke on "Attacking the Material Handling Problem in the Plant or Warehouse" at the March 18 meeting of the Northeastern Ohio Chapter, Material Handling Institute, at Hotel Allerton, Cleveland.

SECRETARIES: This is your department. Send in news of your organization's activities.

CONSULTING ENGINEERS DIRECTORY

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Descriptive bulletin ER-102 sent on request or ask for quotation based on your specific requirement.

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Engineers—Contractors—Manufacturers
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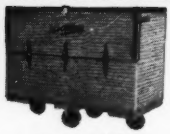
Is your Materials Handling ACCIDENTAL or ENGINEERED ?

Dolly & Flat Trucks Low Platforms

Two Wheel Trucks


Box and Four Sided Trucks

Three Sided Superstructure

Shelf Trucks

Non-Tilting Platform Trucks

Balance Type Stake Trucks

Balance Type Rack Trucks

Wagon Type Trucks

Trailer Trucks

Truck Casters and Parts

Rubber Tired and Metal Wheels

Nutting

Makes Over 1000 Standard and Special Truck Designs *for Every Purpose*

In many businesses, the handling of materials has grown on a "hap-hazard" basis, as the business has grown. If this is true in your case, you will be surprised at how much your whole production program can be speeded up—and your handling costs reduced—by a properly engineered materials handling system and selection of trucks exactly suited to each type of work. More than 1,000 truck designs have been developed in the Nutting line because they were needed.

CALL IN A NUTTING SALES ENGINEER—let him, backed by the Nutting factory, help you select the right truck for each job. Consult the classified section of your phone directory, or write us direct.

NUTTING TRUCK & CASTER COMPANY — our 57th Year

1602 DIVISION STREET WEST, FARIBAULT, MINNESOTA

NEW PRODUCTS . . .

(Continued from page 67)

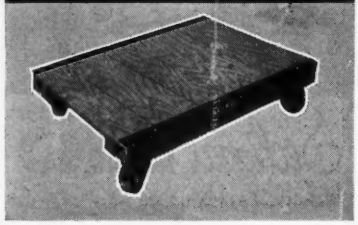
x 2" Solid Cushion Rubber Tires.

TWIN LIFT TRUCKS

NP240—Perfecold Industries has developed a new equipment handling apparatus, known as the Perfecold Liftruk. Consisting of two trucks

weighing 48 pounds each, the set has a recommended capacity of 2500 pounds. It is designed so one man can move capacity loads on level surfaces. Cargo can be moved forward, sideways, turned around, and pivoted.

SKID DOLLIES



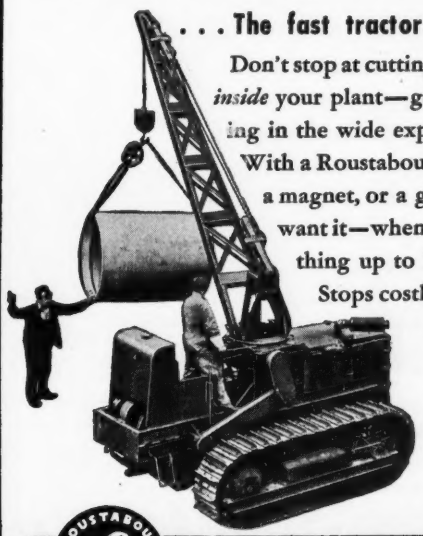
Something new! Combination live-skid and Dolly. Used with or without a lift truck. Hardwood deck bound by steel angles. Standard underclearances to fit your lift truck. 2 swivel and 2 rigid casters. Semi-Steel or solid rubber wheels. Use it as a Dolly for light loads; jack it up with a lift-truck for heavy loads. A really handy arrangement.

QUICK DELIVERIES
SEND FOR BULLETIN No. 6-D

Plant—Bedford, Va.

RE-BO MANUFACTURING CO., Inc.
331 Madison Ave., New York 17

Reduce Costs Outdoors as Well as In with ROUSTABOUT CRANES



. . . The fast tractor-footed load hustlers

Don't stop at cutting materials handling costs *inside* your plant—go outside and start slashing in the wide expanses that eat up profits. With a Roustabout crane you've got a hook, a magnet, or a grab-bucket anywhere you want it—when you want it. Handles anything up to 7½ tons, uphill or down. Stops costly, manpower-wasting delays. Modernly engineered for years of overwork . . . mounted on crawler or wheel tractors. Write for the whole efficiency story now—to **Dept. C-3.**

ROUSTABOUT CRANE

HUGHES-KEENAN CORPORATION
MANSFIELD, OHIO, U. S. A.
Load-Handling Specialists since 1904

more MORGAN "custom-built" PALLETS

Courtesy of American Education Press, Inc.

to cut Handling Costs

Pictured above is another carload of Morgan pallets designed to solve a specific material handling problem, efficiently and economically.

Take advantage of our construction "know-how" and large production facilities for pallets custom-built to your specification. Just send us your requirements and we'll furnish a prompt quotation.

MORGAN LUMBER SALES CO.
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EUCLID CRANES

"get down to business"

3 Ton Euclid Crane built for the City of Schenectady.

—namely the business of efficiently handling material or equipment over long trouble-free periods with a minimum of maintenance or repair costs.

Euclid Cranes are fully guaranteed as to performance and service. Available in sizes from 1/2 to 100 tons capacity and in spans up to 100 feet.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST COMPANY

1362 CHARDON ROAD, EUCLID, OHIO

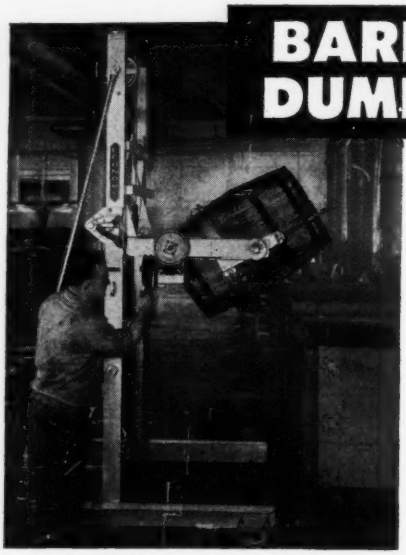
OPERATORS MEET TRAINS . . .

(Continued from page 48)

No. 12 Section of the shake-out. Thus, each type of casting produced is in a definite location at all times—and the castings are at the same time also automatically separated. This in turn makes a later separation job unnecessary.

A certain amount of re-usable materials is developed in the cycle—bottom boards and bands—which must be returned to the mold makers. The trains serve for this purpose as well.

Operators stationed along the shake-out hoppers sprue the castings, placing the latter in metal drums spotted parallel to the line. These drums are set on supports, providing underclearance for subsequent fork truck handling. After cooling, a fork truck employed in the area picks up two full drums for transfer to the cleaning-inspection department located in the south portion of the room. (The



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FOR HANDLING A BARREL, DRUM OR SKID

An efficient method of lifting and dumping barrels is provided by the Economy barrel dumper. A special cradle and tilting winch holds the barrel at any angle for draining.

Cradle and winch can be detached for skid handling, using the platform arms alone. The Economy line of portable lifters range from 500 lbs. to 5000 lbs. capacity and up to 60 ft. lift. Special equipment engineered. Complete catalog on request.

ECONOMY ENGINEERING CO.

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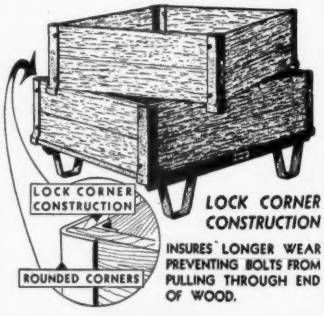
LANHAM FOR LIFETIME

Sectional BINS



LOCK CORNER CONSTRUCTION INSURES LONGER WEAR PREVENTING BOLTS FROM PULLING THROUGH END OF WOOD.

FULL LENGTH CORNER ANGLES TO TOP OF BIN TO PROTECT LUMBER

Also PERMANENT BINS WELDED TO SKIDS • SPECIAL SKID BOXES AND TIERING BINS

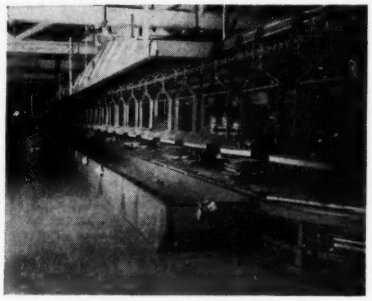
LANHAM

TWELFTH AND MAGNOLIA STS.

LOUISVILLE 10, KENTUCKY

sand drops through the grating of the shake-out to a belt running in an enclosure at basement level. This part of the operation is detailed in later paragraphs.)

The large number of castings continually produced on a five-minute cycle naturally entails a sizable volume of sprues or gate. Its removal is likewise mechanized by use of a chain conveyor which circles 18″x30″ single-deck trays (see



LARGE VOLUME OF SPRUES is carried by conveyor from shake-out hopper, left.

photos) over the length of the shake-out hoppers on both sides of the layout. The trays are mounted on the traveling chain (about 415 lineal feet) on 48″ centers. The conveyor has a variable speed drive and is powered by a ¾ h.p. motor. The trays are discharged into bins which are then transferred to the raw material storage area north of the cupolas.

Neat Finishing Layout

The foundry takes up slightly more than half the length of the 700-foot-long room, the remaining part being devoted to cleaning and inspection (on the west side) and to grinding (on the east side). As previously mentioned, the cooled castings are delivered by fork truck to the cleaning station. The operation completed, the cleaned castings are loaded into 6″x18″x30″ tote boxes. The full containers are placed on a gravity roller conveyor, along which the inspectors are stationed and which extends through this part of the room.

The inspectors are stationed on both sides of the conveyor line, each one using two roller top tables set at right angles to the longitudinal conveyor. The working area of

Learn more about
LYON-Raymond's *New* HYDRAULIC
Pallet Lift Truck . . .

Streamlined! Lightweight!

FRAME —High strength alloy sheet steel formed into strong box sections.

AXLES —Heat-treated alloy steel.

WHEELS —(and other non-structural parts) made from aluminum alloy.

BEARINGS —Anti-friction bearings used at all important points in lifting mechanism.

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WEIGHT —Reduced to a minimum by new design and modern lightweight construction.

This advanced construction fits the Lyon-Raymond Hydraulic Pallet Lift Truck to do jobs with speed and ease never before attained by hand pallet trucks. Write today for complete information that may save you time and money!

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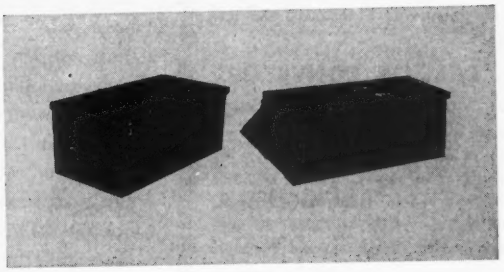

Pictured are two types of Rack engineered shop boxes. Heavy gauge metal plus quality welding gives an unusually long service span. For information on all types and sizes, write Department 32, 925 Liberty Avenue, Pittsburgh 22, Pennsylvania

RACK ENGINEERING COMPANY

MATERIAL HANDLING ENGINEERS

PITTSBURGH, PA.

CHICAGO PHILADELPHIA DETROIT

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of Production Delays and Costly Messenger Service...

Speeding tools and requisitions by Tubes at International Business Machine, Endicott, N. Y.

LAMSON

Pneumatic Tubes

RUSH papers, blueprints, shipping orders, mail, time tickets, small tools and specimens to any desk in your plant.

SAVE time, money and motions. Coordinate your various departments for greater efficiency.

Yet Lamson Tubes are surprisingly low in cost. In many plants they pay for themselves in less than two years. In one plant, they saved $150,000.00 the first year.

LAMSON CONVEYORS

Cut Materials-Handling Costs up to 30% . . . They eliminate heavy physical work . . . speed production by maintaining a steady flow of materials . . . free men for more important jobs. And they save up to 30% of your manufacturing dollar. Lamson Engineers can design, build and install Conveyors in practically any plant, warehouse or factory.

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Please send me your free bulletin on the following:

☐ Pneumatic Tubes

☐ Conveyors

Name of company.....

Address..... City..... State.....

By name and position.....

each inspection table is effectively utilized as follows: one box for passed castings, one box for scrap, and the third and last one with castings to be picked. The second table holds three boxes of work at all times, the reserve from which the inspectors draw their work.

The boxes of castings which have been passed are routed south over the line. Near its end point the boxes move onto a roller section which is a scale platform. After weighing, the recorded boxes may follow either one of two paths, depending on the work that still remains to be done. 1. Castings that are to be snagged pass over a 90-degree conveyor section to the east side of the room to the grinding machines. 2. Castings that need no further work are placed on skids (just ahead of the turn) for transfer to the machining and assembly departments.

Sand Handling System

As mentioned in an earlier paragraph, the spent sand that drops through the shake-out grating is discharged on a belt conveyor traveling in an enclosure below floor level. This line delivers to a "cross" conveyor, one at each side of the dual layout. The material from both sides now travels to a common center, the boot of a bucket elevator. The arriving sand first travels over a magnetic pulley, which routes the scrap iron and magnetic refuse via a two-way chute to boxes in the sand storage bin pit. The sand is delivered by the bucket elevator, via a screen, into a 100-ton storage tank. (Equipment used in sand handling is indicated at the south end of the flow diagram.) The two discharge hoppers of the overhead tank are at an elevation of 60 feet above the foundry floor.

From here the sand is spouted to a revolving hexagonal screen where the lumps and tailings are separated. The sand passing through the screen is hoppered to a belt bin conveyor via a fines manifold. This belt conveyor is equipped with ad-

The

"LITTLE HUSTLER"

TRANSFERS STAMPINGS AS FAST AS PRODUCED!

The "Little Hustler" is fully portable and quickly adjustable to a wide range of applications. The 8 foot size shown above has a maximum delivery height of 81 inches at 45° and 50 inches in a horizontal position. Made in 13 models: 4-6-8-10 and 12 ft. long, by 12", 18" or 24" wide. Also special sizes. Send for circular LHC. We design and manufacture permanent conveyor systems and all types of SPECIAL EQUIPMENT.

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MADE TO YOUR SPECIFICATIONS!

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justable plows for distribution of the sand to the storage bin, of 100-ton capacity. The bottom of the bin is hoppered to terminate in four double jaws, air controlled bin

FORK TRUCK moves castings from shake-out. Operator is picking up second loaded drum.

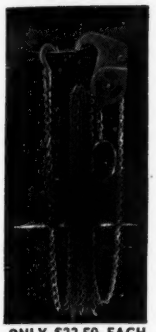
gates. Two of these gates discharge sand to 3,000-pound-batch hoppers for charging measured batches to the larger of two mullers with a capacity of 30 cu. ft. per batch. The other two gates discharge sand to 1,500-pound-batch hoppers for charging measured batches to the smaller mixer, with a capacity of 15 cu. ft. per batch. Each mixer is equipped with hoods to suppress dust during the mixer charging operation.

After mulling, the reconditioned sand is discharged through double air-operated discharge gates via a hopper to a belt mill which delivers via bucket elevator to the aerator, shown in the diagram. Aerated for proper flowability, the prepared sand is then discharged to an overhead 30″x125′ belt distributing conveyor, shown in the flow sheet, which runs 15 feet above the foundry floor. As can be seen, this sand distribution belt runs in the center between the two batteries of mold making stations on the floor below. Manually operated plows along the belt permit the sand (traveling at 150 F.P.M.) to be discharged to the 15 hoppers aranged below on each side of the line.

The discharge sweeps, or plows, are positioned with set screws across half the width of the belt, thus loading two hoppers simultaneously, one on each side. A variation of this method is to set two sweeps a few inches on each side of the belt, permitting sand in the center to travel for loading of two additional hoppers further along

WORLD'S EASIEST WAY TO OPEN ANY BOX CAR DOOR

MONARCH ONE MAN CAR DOOR OPENER



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Just Place One Under Each End of Heavy Objects —Pry Off the Floor and Move It Fast and Easy.

High Leverage Ratio.

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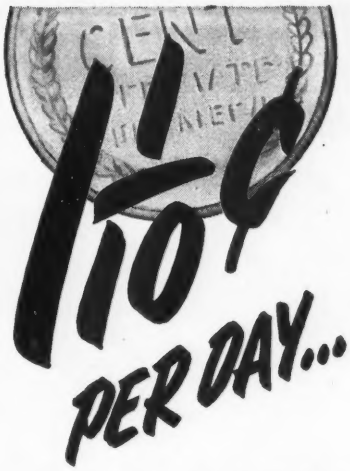

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Initial low cost of a Hydrolectric Lift Truck is NOT just a down payment on year-in, year-out repair bills. Top-quality construction keeps Hydrolectrics on the job . . . prevents costly breakdowns. Machined, standardized parts, — actually priced as much as 80% lower than parts for competing trucks—simplify and speed occasional repairs . . . cut downtime to a minimum. Write for catalog L giving full details of this amazing new truck.

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Camp's No. 7 is applied like cement over your present wood or concrete floors. A ¼ inch thickness resurfaces worn or rough concrete floors to withstand any traffic. Sets in three or four hours—ready for heavy trucking in 24 to 48 hours. Camp's No. 7 comes ready to mix—nothing else needed. Your choice of brown, red and natural dark gray.

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- Hook, Bolt or Trolley Suspension.
- Positive Electric Brake. Enclosed Limit Switch.
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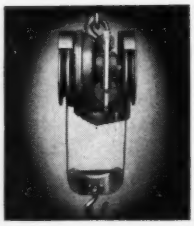
TODAY'S TOP VALUE IN HOISTS



Sturdy cast iron double drums balance load, eliminate overlapping cable. Simple, rugged construction employs only two gear reductions — one worm gear and one spur gear. Worm is of high quality steel forging, hardened and ground, operates on Timken radial thrust bearings. Best grade chilled phosphor bronze used for worm gear. Spur gears machined from forged steel blanks with full depth teeth. All gear shafts operate on ball bearings, fully enclosed, in a bath of oil.

The CONCO TORPEDO ELECTRIC HOIST is fast, compact, powerful, easy-to-operate. Double drum construction centers and balances load, assuring an even lift, freedom from sway, greater safety and efficiency for the operator. Write today for detailed specifications and prices. Prompt delivery.

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38 GROVE ST. MENDOTA, ILLINOIS

the path of travel. One operator on the upper level serves the 30 mold makers on the foundry floor. The latter are assured of a continuous supply of sand, withdrawing the material through conveniently operated swing chutes.

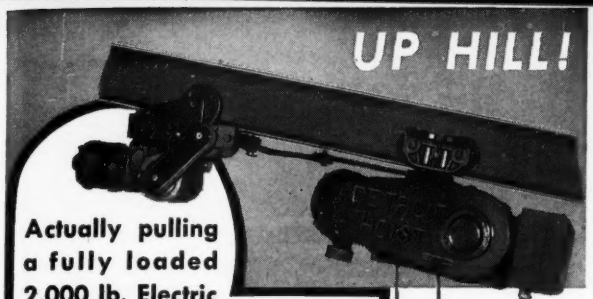
The principle of "a device for every purpose" is again exemplified in the handling of the fresh sand. The stockpile of fresh sand is located in a covered room paralleling the foundry. A 4,000-pound fork truck with a scoop attachment adds about four tons of fresh sand daily to the system through the grating of the shake-out hoppers.

Special equipment for the health and comfort of operators include exhaust hoods, one over each shake-out station, and a dust-collecting system. Each hood is equipped with three exhaust fans with a combined capacity of 45,000 cu. ft. per minute, or a total of 90,000 cu. ft. for both sides of the layout. Ventilating ducts at each end of the foundry replace the air withdrawn. The dust collecting system is located to the south of the shake-out stations. It collects the dust from the basement area, which is blown into a sprinkler unit. Through contact with moisture the particles are settled and then removed.

Work Moves, Operators Produce

It is easy to see why production has been increased 50 per cent with the mechanized handling equipment. The work keeps rolling on wheels, and the operators stationed in the various locations are not losing time because of leg-work, which is often the case in operations of this type.

From the raw material to the final inspection stage, the work advances progressively through the large room. Each handling device —skip hoists, monorail ladles, mold-bearing trains, fork trucks, sprewing conveyor, and the gravity roller inspection lines—moves the products at the various stages of the cycle in an orderly manner at a production rate averaging about 6,500 molds per eigth-hour shift.



Actually pulling a fully loaded 2,000 lb. Electric Hoist up a 5% grade . . . .

New Trojan TRACTOR

The *TROJAN TRACTOR* can be applied to *TRAVEL* . . .

1. Present hand travelled monorail hoists.
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3. Monorail conveyor lines.
4. Open and Close garage and hangar doors.

You probably have slow, hand propelled units which the Trojan Tractor can move by power,—faster and economically. Let us know what they are; we will give you the details.

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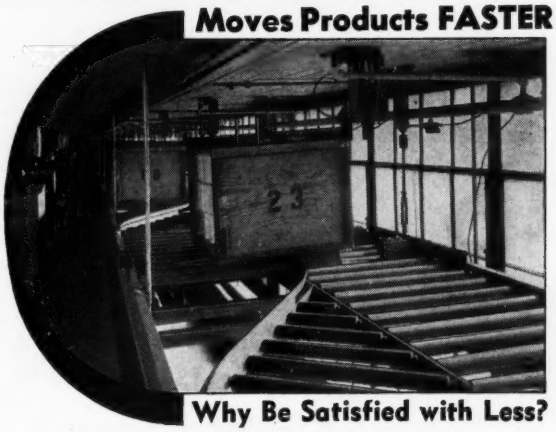
Moves Products FASTER



Why Be Satisfied with Less?

Speed up production in your plant by means of an A-F *endless stream* conveyor system especially designed to solve your materials handling and products handling problems. All over the world A-F Engineered Conveyor Systems are making factories more efficient. A-F Engineers can solve *your* problems—and bring you greater production and economy in handling operations. Write today for full information.

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CONVEYING EQUIPMENT
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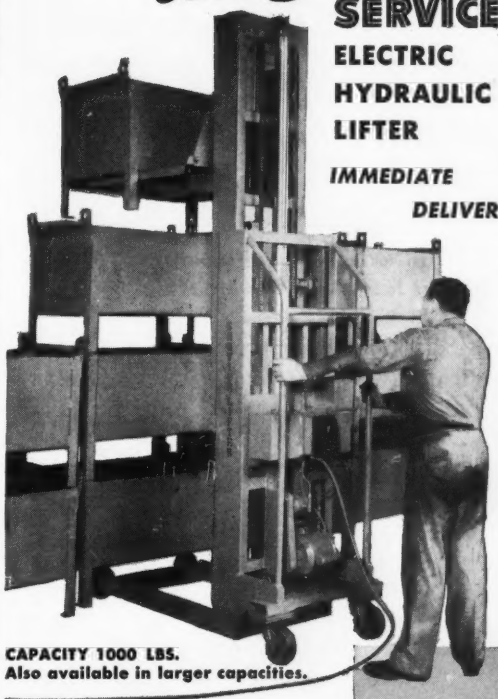
METAL PRODUCTS CLEANING EQUIPMENT

new improved

SERVICE ELECTRIC HYDRAULIC LIFTER

IMMEDIATE DELIVERY



CAPACITY 1000 LBS.
Also available in larger capacities.

Handles Heavy Loads With Speed, Ease and Safety

With the Service Electric Hydraulic Lifter any light socket in your plant is a power source for lifting up to 1000 lbs. . . . as high as 8' 8". . . by simply pressing a button. This is the practical equipment to *lower* handling costs as you *lift* heavy loads more efficiently . . . to make the handling of *dangerous* loads easier and *safer* for your men.

With twin roller lifting chains, either of which will safely hold the load . . . push button control . . . safety valve to prevent overloading . . . all the other features listed here . . . this new better Service Electric Hydraulic Lifter deserves a spot in your plant.

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Features Like These Will Cut Your Handling Costs

- Lifting speed 10 feet per minute.
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- Platform lift 8' 8".
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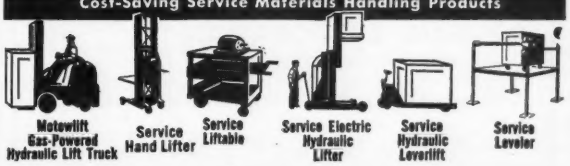

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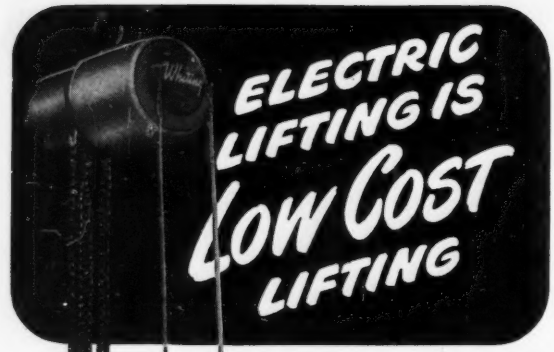

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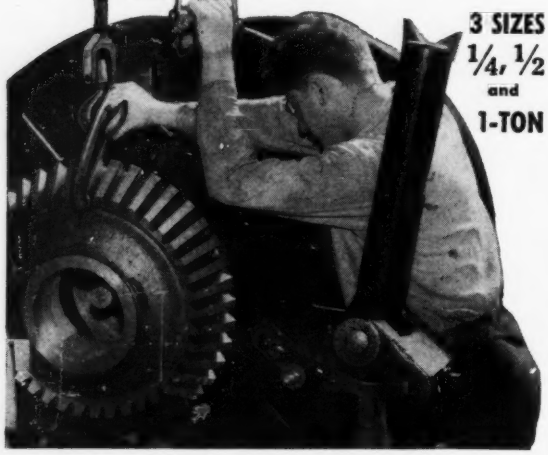
The Whiting Electric Hoist is 13 TIMES as fast as a Hand Hoist . . .

Yet this ONE-TON Size

Costs Only $230.00 F. O. B. HARVEY, ILLINOIS

By releasing men and machines for productive work, the Whiting Electric Hoist pays for itself in a very few months. You can figure on this basis: if this new hoist saves just one man only 12 minutes a day, it pays a profit!



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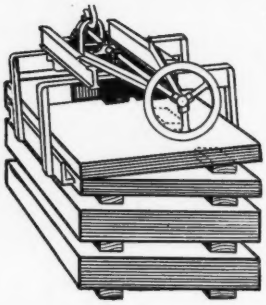

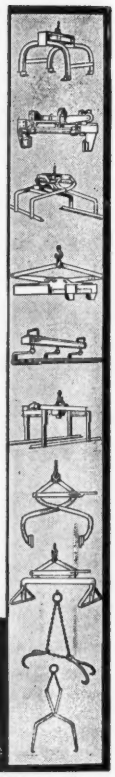

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Let the mill ship in any size bundle. Then split it on the car with our standard Grab. The "take" slides smoothly into place, where it is securely held until deposited. Form 595 tells how. Send your inquiries to us or to the man from whom you buy your cranes.

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For protection against tramp iron during processing, Homer offers the best in non-electric, plate type permanent magnetic separators. Standard widths from 4" to 26". Special sizes upon request. Cast frame requires no insulation . . . cover protects powerful Alnico assembly from dust and moisture.

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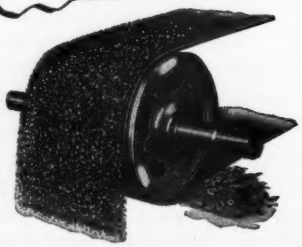

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Solve it with easily adaptable

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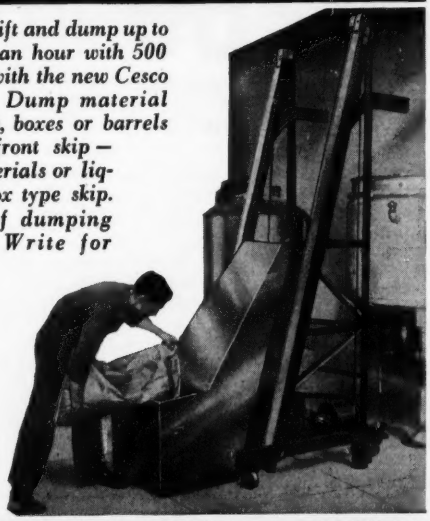
LIFTS and DUMPS UP TO 50,000 LBS. IN ONE HOUR

You can lift and dump up to 100 trips an hour with 500 lb. loads with the new Cesco Dumper. Dump material from bags, boxes or barrels in open front skip — loose materials or liquids in box type skip. Choice of dumping heights. Write for catalog.



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358 HOPPER-CAR UNLOADER

Here is the versatile car unloader — capable of unloading a hopper car in 45 minutes — ideal for steam coal, coke, or other abrasive materials. A heavy-duty, all-material unloader, the 358 features a non-slip, non-plugging belt, precision transmission, antifriction bearings . . . is equally efficient over the rails or in track pits. Capacity up to 3 tons per minute.

363 BELT CONVEYOR

Here's the newest portable conveyor on the market! The 363 is a high-capacity one-man unit that will pay for itself on large or small jobs by reducing costly truck waiting time, speeding unloading and reclaiming work. Its advanced B-G design includes the sturdier yet lighter stair channel construction and features a removable tail pulley cover. Plain or cleated belt.

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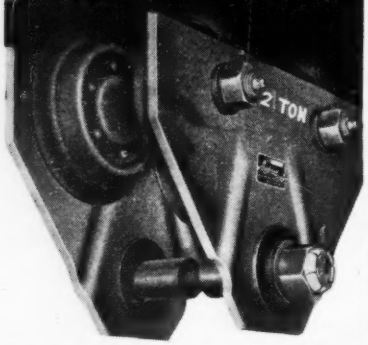
SAGINAW
chain hoist trolleys



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Specify Saginaw for the tough jobs! Advanced design and construction features, guarantee long life, effortless travel, low maintenance cost and wide versatility under the most trying conditions. Write for catalog of complete line including prices and specifications.

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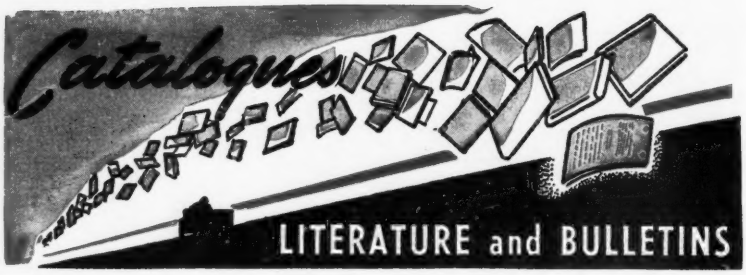

The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

481—Belt Catalog . . . A new catalog section on the guide to proper selection of conveyor belt grades has just been published by The B. F. Goodrich Co. It explains the yardsticks employed in belt engineering to differentiate grades, pictures and describes the conveyor belts in its line, and describes special constructions in the various grades.

482—Elevator Belts . . . A catalog section on its line of elevator belts has just been published by The B. F. Goodrich Co. The section describes and pictures the various belts for this service and gives pertinent data.

483—Foundry Equipment . . . Bulletin No. 204 released by Newaygo Engineering Co., describes and illustrates equipment used by jobbing and production foundries. The units presented include sand handling systems, mold conveyors, turntables, rotary plate feeders, sand gates, conveyor belt take-ups, sand coolers and aerators, core crushers, sand conditioning mills, core drawing machines and floor line markers.

484—Hand Trucks . . . A bulletin, illustrating and describing Wheel-Ezy hand trucks, has been issued by Rapids-Standard Co., Inc. It describes various features and specifications in detail.

485—Crane Film . . . A 16 mm. sound film, "It's Your Move" has just been produced by The Thew Shovel Co. It depicts the application of rubber-tire and crawler cranes to a wide variety of industrial material handling jobs.

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TERMS IF DESIRED $50-$1000-1 YEAR

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ELECTRIC FORK TRUCKS

NOW OFFERING AT A PRICE AVERAGING 60% OF NEW

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	5,000 Lb.	150,000	119"	$5,100	$3,000
BAKER RAULANG	6,000 Lb.	144,000	60"	$5,500	$3,250
CLARK	6,000 Lb.	150,000	104"	$4,350	$3,000
ELWELL-PARKER	4,000 Lb.	120,000	117"	$4,825	$3,250
	5,000 Lb.	90,000	105"	$4,000	$2,750
	6,000 Lb.	180,000	59"	$5,005	$3,500
MERCURY	4,000 Lb.	120,000	107"	$4,250	$3,000
	5,000 Lb.	160,000	104"	$4,600	$3,250
YALE (Platform	4,000 Lb.			$3,000	$1,500
	6,000 Lb.			$4,000	$1,950
Due to expense of putting gas models in like-new condition, we are continuing our former prices—					
CLARK	4,000 Lb.	60,000	108"	$2,750	$2,100
	6,000 Lb.	150,000	104"	$3,385	$2,400
HYSTER	2,000 Lb.	30,000	104"	$2,150	$1,600
ROSS	6,000 Lb.	150,000	10"	$5,200	$4,000 Unused $3500 Used
ROSS STRADDLE LUMBER CARRIER—7½ Ton				$6,600	$4,000
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YOU CAN ALSO RENT THIS EQUIPMENT BY THE DAY, WEEK OR MONTH USING YOUR OWN OPERATORS.

HARRY M. RIGHTER, Inc.

Foot of W. 45th St., Cleveland, O. 7:30 a.m.—4:00 p.m. ATlantic 1631
OWNED, OPERATED AND MANNED BY VETERANS OF WORLD WAR II

486—Power Shovels . . . Bulletin No. 846-R on the Buckeye Model 70 Clipper Power Shovel has just been released by Gar Wood Industries, Inc. All the improvements that have been effected in this Mevac-controlled shovel are shown in the bulletin.

487—Traffic Lines . . . Industrial Tools & Products Corp. has issued a bulletin describing its gasoline and electric powered industrial traffic line marker, the Streme-Liner. It illustrates use of floor lines in various industries and describes features of the machine.

488—Twin Dollies . . . "Skat-Skaters," dollies used in pairs for moving heavy machinery, refrigerators, etc., are illustrated in a pamphlet issued by Hulbert Mfg. Co. The device is designed to permit one man to move loads without extra help.

489—Overhead Cranes . . . A 28-page brochure, describing electric traveling cranes for three-to-150-tons capacities, has been issued by Victor R. Browning & Co., Inc. It contains chapters on the bridge, trolleys, cranes, brakes, hook blocks, cages, motors, clearances and buckets.

490—Layout Models . . . Magne-Plastic layouts, designed by Engineering Service, Inc. of America, are described in a bulletin available now. The literature explains and shows how layout prints can be made quickly with the plastic models.

491—Power Shovels . . . Gar Wood Industries, Inc., has issued a 32-page bulletin on its line of Buckeye power shovels, trench hoes, etc.

GENEVA WHEELS OFFER:

WIDE RANGE OF SIZES

WIDE RANGE OF TYPES

—ENGINEERED METAL DISTRIBUTION

EXPERT ENGINEERING SUGGESTIONS

TROUBLE-FREE PERFORMANCE

★ 5 Star Headings describe our wheel service. Complete engineering and a modern plant efficiently equipped to serve your wheel requirements. Wheel problems? Send them to GENEVA!

SOLD ONLY TO MANUFACTURERS OF PORTABLE EQUIPMENT

GENEVA METAL WHEEL CO.
198 RAILROAD ST. • GENEVA, OHIO

492—Scales . . . A bulletin describing Shadograph Scales, using shadow projection of readings, is available from Exact Weight Scale Co.

FREE-ROLLING LONG LIFE, LOW MAINTENANCE

Fig. 760
1-Bar Handle

Fig. 753
4-Wooden Stakes

Fig. 762
2-Pipe Stakes

WITH

HALLOWELL

TRUCKS of STEEL

Fig. 772
1 Rack

Fig. 751
4-Pipe Stakes

Fig. 757
2-Bar Handles

They're built to stand up for years against gruelling punishment . . . and their sturdy, welded steel construction insures against weak, loose joints and wobbly trucks. Free-rolling wheels and casters run easily, even under heavy loads. There are many types and styles —a few of which are shown—*each* a model of smooth-running durability—available for almost *every* service. Ask now for your copy of the "Hallowell" Catalog—it describes them all.

OVER 45 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

BOX 799, JENKINTOWN, PA.

Branches: Boston, Chicago, Detroit Indianapolis, St. Louis, San Francisco

HOOPER-GREEN CO., 1039 North Pennsylvania St., Indianapolis, has been appointed district sales representative in the Indiana territory by Baker-Industrial Truck Division of The Baker - Raulang Co. The Indianapolis branch of Hooper - Green is in charge of A. J. Stone, who formerly sold related equipment in the territory.

A. J. Stone

THREE sales and service agents have been appointed to cover five New England states by AUTOMATIC TRANSPORTATION CO. They are the GEORGE R. MILLER CO., 171 Watertown St., Watertown, Mass., for Maine, New Hampshire and five northeastern counties in Massachusetts; FREEMAN INDUSTRIAL SERVICE, INC., 450 N. Main St., Providence, R. I., for Rhode Island and five southeastern counties in Massachusetts, G. CASS LIGHTNER, Thetford, Vt., for Vermont.

A. P. CARSTENSEN, JR., has been added to the sales and service departments of OHIO EQUIPMENT CO., INC. He graduated from Dartmouth College and completed a factory training course at Yale & Towne Mfg. Co.

EDWARD HART has been appointed manager of the New York office of AMERICAN ENGINEERING CO., which is located at 75 West St., New York City.

GET RID OF THAT "JERK" IN YOUR LINE

BUSCHMAN roll or wheel Portable Conveyors will roll out those jerks, sags and lags in your production line. Don't let packages or materials pile up — keep 'em moving. Put Buschman Portable Conveyors where they're needed . . . even outdoors. Let them get wet . . . Red Wheel Conveyors don't rust. Fully armored against moisture, they keep your materials rolling profitably. Representatives in principal cities.

Write for Bulletin No. 10

Buschman

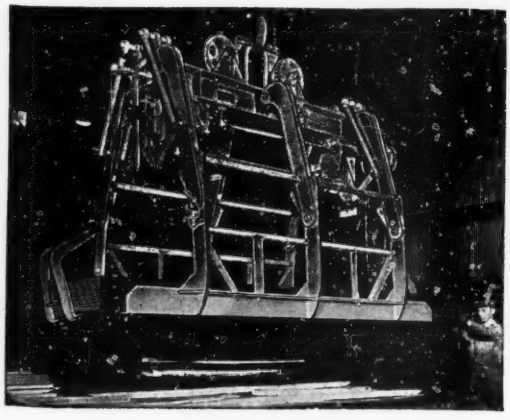
THE E. W. BUSCHMAN CO., INC.
WINTON PLACE CINCINNATI 32, OHIO

LA RAY LIFT-TRUCK SCALE

Now you can end double handling of palletized loads. This cantilever type scale (capacity, 1 to 2½ tons) can be permanently mounted on practically any make of lift truck. Tare bars are at eye level for quick reading. You save time by accurately weighing small parts for inventory purposes — one of *many* jobs efficiently done by this modern unit.

Dealer inquiries invited.

WEISHOR CORPORATION
1029 N. 7th St., Milwaukee, Wis.
MANUFACTURERS OF LaRay PRODUCTS



PROFITS BEGIN HERE...

When carloads of sheet stock are unloaded at the receiving room, actual manufacturing costs begin. But, when sheet stock is unloaded and carried into storage or to the machines with C-F Sheet Lifters, these costs are minimized—stock damage is eliminated and your end profit begins. Because C-F Sheet Lifters, under one man end or remote cab control, handle more sheets per load, safer, faster and more economically, they are the logical answer to the demand for modern, low cost materials handling.

There are C-F Lifters in capacities from 2 to 60 tons or larger, in standard or semi-special designs to meet any sheet or materials handling requirement. Write for new Bulletin just off the press.

Cullen-Friestedt Co., 1320 S. Kilbourn Ave., Chicago 23, Ill.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

OPPORTUNITIES

Men wanted *Jobs wanted* *Lines available*

Rates: for "Positions Wanted" $3.50 minimum, limit 25 words. For all other classifications $3.50 minimum for 25 words, each additional word 10c; boldface type or all capitals, $6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

POSITIONS WANTED

Designing Engineer; has developed two successful Electric Hoists, both on market. Eight years drafting board. College. Age 31. Specialist in Mechanical Design. Box 5548.

IDEAS FOR SALE

Complete Engineering and tracings for Electric Hoist. This product has been built in several capacities and is tested and ready for production. Box 5348.

Complete Engineering for new type of Portable Belt Conveyor. This product has been built and tested. Frame is designed for tubular steel construction. Box 5448.

EQUIPMENT FOR SALE

NEW PLATFORM LIFT TRUCK

Salsbury Turretter Model TLN-4660. Overall Width of Platform 18″ Minimum Height 6″ Lift 3½″ Platform Length 60″ Immediate delivery FOB Phila. Box 5248, Flow.

All Hardwood pallets fastened with drive screw, cement-coated nails or ring shank, offered to high bidder, for sale, May 15, 1948.

1 carload—34″ x 52″ fair condition, f.o.b. New Milford, Pa.
1 carload—40″ x 48″ new, f.o.b. Minneapolis, Minn.
100—36″ x 48″ new, f.o.b. Pittsburgh, Pa.
50—35″ x 55″ new, f.o.b. Pittsburgh, Pa.
250—30″ x 44″ new, f.o.b. Tionesta, Pa.
75—60″ x 40″ new, f.o.b. Bishopville, S. C.

P. R. Hobstetter & Assoc.
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Cleveland 3, Ohio

Up to 200 Lewis and Sheppard Skid Platforms 36″ wide x 60″ long x 11″ underclearance with 1⅛″ tops. In excellent condition priced to sell $7.50 each F.O.B. Eavey Co., Xenia, Ohio.

EQUIPMENT FOR SALE

ELECTRIC HOISTS

We have a fine stock of NEW one-motor, monorail type, Hi-Lift electric hoists in capacities from 1 to 5 tons. Immediate shipment. Also prompt delivery of overhead cranes and monorail systems.

ABELL-HOWE COMPANY
53-a W. Jackson Blvd. Chicago 4, Ill.

HELP WANTED

MATERIAL HANDLING SALES ENGINEERS

Nationally known manufacturer of material handling equipment is searching for competent sales representatives.
Must have mechanical or electrical experience and practical knowledge of material handling methods.
Several productive territories available. Write for personal interview. Box 538, Flow.

NEW LINES WANTED

MANUFACTURERS

Are you properly represented in Pennsylvania, New Jersey, Delaware, Maryland and the District of Columbia? We as a sales agency desire a few lines on a commission basis. At present we represent a few nationally known lines. References exchanged. Address Box 5148, Flow.

Topnotch sales organization with extensive engineering background operating in Boston area wants additional lines of materials handling equipment. Our organization has wide-acquaintance with key buyers in this territory who are accustomed to consult us on their handling problems. We are therefore in a position to recommend quality products for a wide variety of materials handling jobs. Write Box 5648, Flow.

Announcing

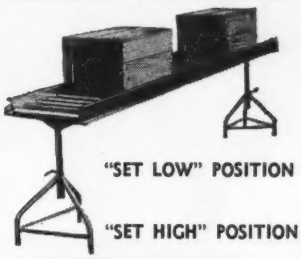
THE NEW FERGUSON ALUMINUM

TURN-IT-OVER

CONVEYOR

Lighter than steel . . . **with the well-known two-in-one feature . . .** ***portable, durable*** **and** ***NOW easier to handle!***

"Set Low," the channel side rails form a protective guard for small packages—and, by simply turning it over, the rollers are "Set High", permitting the handling of packages larger than the width of the conveyor. These dual-purpose units are made in 10′ -0″ standard lengths in a number of standard widths and curves. Write for details.



"SET LOW" POSITION

"SET HIGH" POSITION

Ferguson "Turn-it-Over" Conveyors are also available in steel, in both Gravity Roller and Gravity Wheel Types.

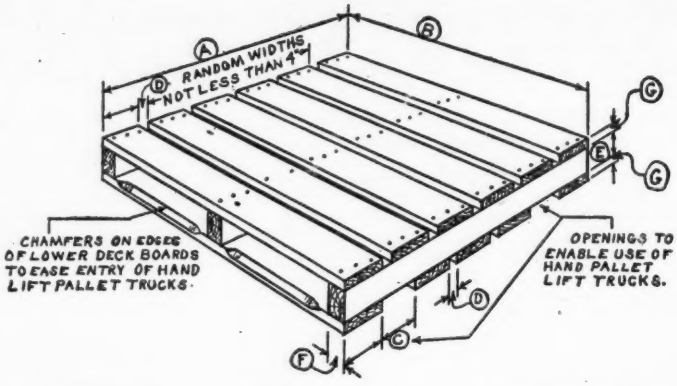
HARRY J. FERGUSON CO.

WHEEL • PORTABLE BELT • BELT AND ROLLER GRAVITY CONVEYORS

121 WEST AVE., JENKINTOWN, PENNA.

JUNE ISSUE BRIEFS

How much is saved with planned material handling—in dollars, effort, manhours, square footage? More vital questions of costing will be answered in a prize-winning Cost Analysis paper in the June issue. . . . What are some of the advanced flow methods developed in packaging fertilizer, household wax, cigars, and other products? . . . What system does a prominent metal fabricator use in operating his monorail warehouse for wire coils? . . . How did a manufacturer accomplish storage of 45 units where only nine could be piled before? . . . With building expansion not feasible, how did engineers in an assembly plant contrive to solve the problem by "hiding the ceiling"? . . . What methods are there for using records economically to serve as "blue prints for production"? , , , These and other questions will be answered in June and other early issues of FLOW Magazine.



A - STRINGER LENGTH
B - DECK BOARD LENGTH
C - WHEEL OPENINGS
D - DECK BOARD SPACING
E - STRINGER HEIGHT
F - STRINGER THICKNESS.
G - DECK BOARD THICKNESS

SEASONED HARDWOOD PALLETS

Ordering our seasoned hardwood pallets gives you an important saving in initial cost. Their light weight means lower freight. Fill in specifications above or send us your drawings for prompt quotaton.

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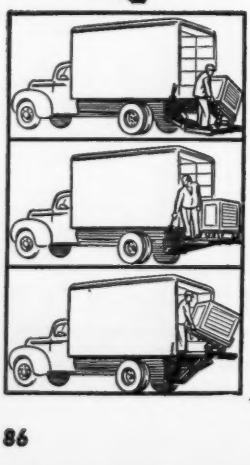
"Floor-to-Floor"

DELIVERY SERVICE

From Shipper's floor to Consignee's floor in less than half the time.



- Your trucks or trailers can now be loaded and unloaded much quicker by Anthony "Lift Gates," the very latest in modern cargo handling equipment. This means faster pickup, faster delivery—no unnecessary delays.
- Your drivers can handle heavy shipments much easier. Merchandise is handled gently and safely—minimize damage claims.
- No tying up area ways. Loading doors open a shorter time. Reduces confusion at the dock.
- Shippers and receivers alike, like this extra service because it costs them less to use your service.

ANTHONY LIFT GATE HYDRAULIC

Free *New miniature "Lift Gate" demonstrator sent to you upon request. Clearly shows you how easy it is to load and unload trucks in less than half the time.*

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Why ENGINEERED DESIGN PALLETS?

If your production problem is more space, pallets might be worth your investigating.

ENGINEERED DESIGN pallets, specially tailored to *your* operation, reduce operating costs by permitting simpler handling, more economical production.

Pallets Incorporated

Manufacturers of
ENGINEERED DESIGN *Pallets*
GLEN FALLS, N. Y.

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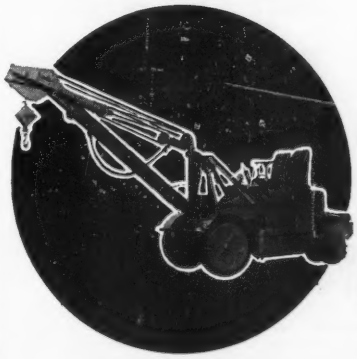

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- PORTABLE gives you the opportunity to first RENT in order to TRY, then DEDUCT rentals when you buy!

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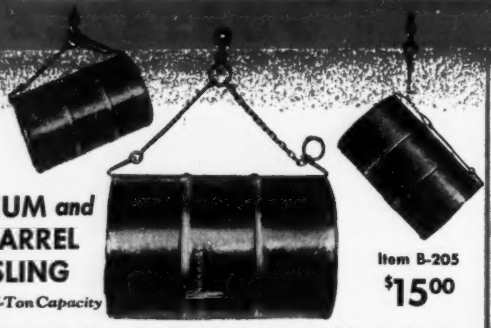
PORTABLE SERVICE EQUIPMENT CO., Inc.
3519-31 N. FRONT ST., PHILA. 40, PA.

Everything You Need in

MATERIALS HANDLING EQUIPMENT



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Will handle drum for drainage purposes. Use for loading on or unloading truck and for general purpose handling. Will handle barrels, drums, kegs, anything with a lip such as on drum or barrel. Easy to operate . . . heavily welded chain, forged grab hooks. Weight 8½ lbs.

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Use for picking up all types of heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks with an adjustable spread of from 16" to 48". Adjustable for use where ceilings are high or low. Weight 27 lbs.

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For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Will lift up to 2000 lbs.

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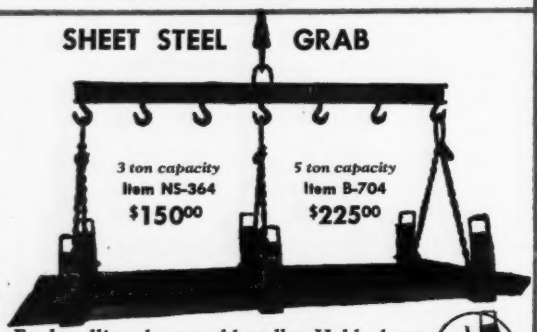

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For handling sheet steel bundles. Holds sheets securely without slippage, distortion or damage to stock. Engineered and built for heavy industrial use.

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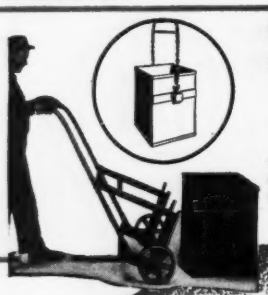
Make a "Boom Skid" out of any standard high lift or fork truck. Ideal for moving heavy equipment or materials. Built any size to fit individual truck.



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Used for moving work in progress between operations. Box can be used with overhead hoist.

Trunnion Box (Minimum 10 boxes)	Trunnion Box Truck
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Handles all types of material or parts. Used with hand, power or truck, or for pickup and moving by overhead hoist. Gravity latch locks box in upright position until ready for dumping—pull on latch releases the box—dumping is automatic.

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Automatic Dump Box $79.00

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A barrel tilt for controlled dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.

When Ordering Always give "Item" numbers this will help prevent error. All prices are f. o. b. Detroit. Prices subject to change without notice.

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DOUBLE BALL BEARING SWIVEL CASTERS

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V-GROOVED WHEELS FOR ANGLE IRON TRACKS

A COMPLETE SELECTION OF ENGINEERED CASTERS DESIGNED FOR EVERY TYPE OF DUTY

Save costs 3 ways!

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3. FLOORS: No need for costly floor alterations or floor covering—Faultless wheels are available for all types of floor surfaces and loads.

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Other "C. B. P." magazines published by the Industrial Publishing Company are REFRIGERATION INDUSTRY, for the refrigeration and air conditioning equipment field, INDUSTRY and WELDING, for the welding supply and equipment field, and OCCUPATIONAL HAZARDS, for the industrial safety, health and fire protection field. Send for our booklet: "The 'C. B. P.' Plan . . . A New Dimension Added to Standard Magazine Audits."

Flow **MAGAZINE**

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